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STUDIES

ON MILITARY TRANSPORT.

BY

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PREFACE.

THESE Studies on Military Transport are the result of an inquiry into this branch of military administration which occupied my leisure hours in India. They are published principally because there appears to be a want of a treatise of some sort on this very important subject. All indulgence, I hope, will be made for these few pages, on account of the difficulties under which they were written, from the want of many important military works and reports to refer to, which were not to be obtained in India. A great number of military works, both English and foreign, have, however, been consulted, and what seemed especially to bear on the subject has been embodied in these studies. Not to acknowledge, therefore, the great assistance derived from these works would be an unpardonable omission.

G. A. F.

BOMBAY, 1*st January*, 1878.

MILITARY TRANSPORT.

MILITARY TRANSPORT is the means by which an army in the field is enabled to move with all that is necessary for its subsistence and efficiency.

On account of the variety and immensity of the requirements which it has to look after, it assumes an importance that might be decisive in the operations of a campaign.

Transport is required for a number of articles, the principal being food, forage, ammunition, sick and wounded, baggage, medical comforts, entrenching tools, treasure, tents, material, clothing, &c.

Railways are of invaluable use in transporting men and stores in time of war. They offer the most complete and rapid means for conveying troops, provisions, and war *matériel;* they facilitate the supply of the daily wants of an army, and thus impart to it a considerably increased freedom; still, no amount of railways can do away with a regular transport corps. Colonel Hamley, in his *Operations of War*, says: "The operations of Army Transport in the form of

horses and vehicles will be confined to the space between the depôts formed on the railways and the front of the army."

Railways should not be employed exclusively in war, but in combination with the ordinary roads of the country, for, on account of the facility with which they can be destroyed or rendered temporarily impracticable, they cannot be used as the only roads of communication. It is owing to this weak point of theirs and on account of their number being small, when compared to the ordinary roads, that the importance of these last as lines of communication, has in no way diminished since the introduction of railways.

Rustow, in his *L'Art Militaire au XIX^e Siècle*, says: "Whatever may be the services that railways can render, it is clear that one should not neglect to organize for war the transport of an army because railways are easily destroyed, because their employment may be interrupted by the existence of fortified places, because at last these means of transport are indispensable for the troops when compelled to quit a railway line."

One of the most important advantages obtained by the employment of railways in war is the ease with which these enable a large army to be mobilized and concentrated in a few days. Of two armies equal in every other respect, the one which can first effect its concentration must

undoubtedly gain important strategical advantages. This ease and rapidity of concentration is denied to us by our insular position, for the time to convey a force from the port of embarkation to a distant shore is considerable. The rate of movement of good steamers cannot be calculated at more than 250 miles per diem, whilst contrary winds and stormy weather have their effect in retarding their progress. Railways moving at a speed of twenty miles per hour can run over a distance of 480 miles in the twenty-four hours. These also run generally pretty direct from one point to another; whilst ships have to go round many hundred miles of coast, which increases the duration of their journey. Our army can only concentrate on the coast after landing; it cannot impede the concentration of the enemy's forces in any way, and he will have the further advantage of being able to move forward and occupy the most important strategical points in the theatre of war. If this is intersected by railways, our disembarkation must take place at some port which is the terminus of a railway line, that the troops may be pushed forward by rail; hence the real concentration does not take place until a point is reached on some railway line where, safe from attack, the troops can gather together.

A glance, however, at the following table of wars and military expeditions in which England

has been engaged since the close of the Napoleonic wars, will at once show that most of her warlike operations have been carried out either against savages or badly organized armies, in countries generally wanting in good roads, and where the name even of a railway was unknown :—

Country.	Year.
Nepaul	1815
Mahratta	1817
Burmah	1824
Bhurtpore, siege of	1825
Afghanistan	1839–42
China	1842
Hydrabad, Sind	1843
Gwalior	1843
South Mahratta Country	1845
Punjab (Sutlej)	1845
Punjab	1848
Forcing of Kohat Pass	1850
Expedition against Oormuzaie Wuzeerees	1851
Burmah	1852
Exp. against Oormuzaie and Akazaie Tribes	1852, 1853
Boori Pass	1853
Caffre	1846–47 1850–53
Expedition against Mitchnee Momunds	1854
Crimea	1854–56
Expedition against Sonthal Tribes	1855
Expedition against Busseekhel Afreedies	1855
Persia	1856–57
Expedition against Bozdar Tribe	1857
Indian Mutiny	1857–59
Expedition in Eusofzai Country	1858
South China	1858

Country.	Year.
Expedition against Cabul Kheyl Wuzeerees ...	1859
North China	1860
Expedition against Mashood Wuzeerees.....	1860
Expedition in Jynteah Hills	1862
New Zealand	1861–65
Sittana Expedition	1863
Bhootan Expedition	1864
Abyssinia	1867–68
Expedition to Black Mountain	1868
Do. against Bezotees	1869
Do. against Cabul Kheyl and Taza Kheyl	1869
Red River Expedition	1870
Looshai do.	1871–72
Gold Coast, Ashantee	1873–74
Duffla Expedition	1874–75
Perak	1875

Most of these countries were entirely wanting in the means of subsistence required for a large force, and in many the climate was injurious to the European soldiers; hence our transport corps had to be formed on a very large scale, and was often raised at a very short notice, owing to the impossibility of delaying the operations on account of the climate. In campaigning in unhealthy climates,* the soldier must also be well nourished; for, if badly or insufficiently fed,

* In the *Abyssinian Campaign, &c.*, by Colonel G. T. Haly, late of the 108th Foot (Smith, Elder, and Co.), will be found some useful hints for the management of troops in the field in unhealthy localities.

he will be more prone to succumb to the epidemics of the country.

In most of these expeditions the problem to solve was, how to convey a certain force to a determined point. It was principally a pure question of nicety of arrangements, how best to forward supplies with the force to enable it to exist and accomplish its mission with the least possible delay, so as to derive all the advantages of the good season, in which, only, the military operations could be carried out.

The result of the fighting was not apprehended, as it was reasonable to expect it to be favourable to the best organized, disciplined, and armed force. The difficulty was at times to bring the enemy to an engagement, imbued as he generally was with a dread of the superiority of the European, and proud of the difficult nature of his country.*

A rapid and continuous forward movement was a great element of success—always to an-

* We should abstain from drawing any unjust conclusions from our easy victories over Asiatic or other irregularly organized armies, for the same tactics which have led to a successful result when employed against them would lead to disaster when opposed to a better organized and equipped enemy. The improvements in modern arms have also been greatly to their advantage; we are generally compelled to assume the offensive and drive them from their positions, and the attack of a position defended by a resolute enemy armed with breech-loading arms is now a much more difficult operation than it used to be.

ticipate the enemy, who, for want of organization, was generally slow; to follow up an advantage with rapidity, to harass him from place to place, destroy his stores and supplies, and oblige him to break up and scatter for want of food.

Mr. Fox, in his account of the war in New Zealand, justly remarks: "What we had to convince them of was, that we were better soldiers, personally, than they were; that our force was irresistible; and that, with our superior training and armament, they had no chance of resistance. Short, sharp, and decisive operations were what were wanted, in order to convey to the minds of the natives, not only those engaged in the conflict, but to those at a distance who sympathized with them, the moral conviction that we were their masters."

This could only be obtained by a well-organized and sufficient transport. At Umbeyla a rapid advance, at first, might have interfered with the rising of the hill tribes, but there was no proper transport; hence the troops were delayed, and the numbers of the enemy greatly augmented. In the Waikato campaign in New Zealand, after the skirmish at Kohera on the 17th July, 1863, the troops remained for fifteen weeks without making a forward movement, though the enemy's advanced posts were only three miles off. For, though for the previous

two years a war in that district had appeared to all almost inevitable, the proper means of transport had not been provided beforehand.

Again: In Ashantee our movements were slow. Had our small army been able to push on to the capital immediately after the arrival on the Prah of the envoy from Coomassie, there might have been no fighting at all, and the king, unable to assemble his men in time, would have no doubt agreed to the terms Sir Garnet Wolseley proposed before attacking his army at Amoaful. Here again want of sufficient transport delayed the troops, and a rapid advance was impossible.

No other country in our times has used such a variety of means for purposes of military transport. Elephants, camels, horses, mules, ponies, donkeys, bullocks, horse and mule wagons, bullock carts, carriers, &c., have all been utilized by us for land transport carriage. Indeed, we are rich in material from which to organize a proper efficient transport corps. Our political obligations, the safety of our colonial possessions, and, above all, our relations with many of our neighbouring States in the East, make it always uncertain at what moment we may be called to place an army in the field; it is therefore more incumbent on us than any other military power to direct our attention to the organization of this most important branch of the military service.

De Gerlache, writing on the transport of an army, says: "The transport service is one of the most necessary for the success of an army, and often even for its preservation. It is from it that she obtains her means of subsistence, all her baggage, all her ammunition, and finally by it that she retires without disorder or loss. The transport service is the soul of an army, because alone it gives her life and movement. It is an object which a wise administrator will not lose sight of for one moment, and to which he should devote particular attention, because the success of his operations, and consequently his honour, almost always depend upon it."

Sir J. Adye, in his account of the Sittana War, justly remarks: "It cannot be too constantly borne in mind that efficient transport is one essential element of success."

The wars of 1866 and 1870 and the rapid and signal successes of the German armies imparted a fresh impulse to the study of the art of war, and many of our officers have devoted much of their time to the study of strategy and tactics. Much that is written on these subjects applies principally to European warfare, where armies pretty well balanced in point of numbers, moving in a civilized country, and following the same principles of instruction, organization, and discipline, are opposed to each other; our military education requires, however, a somewhat different training,

as our military expeditions and wars vary immensely from civilized warfare. The difficulties we have to contend with do not occur in European wars; these are difficulties that cannot be surmounted alone by discipline and courage, but are to be met in the first place by judicious, well-matured pre-arrangements, and afterwards by the utmost amount of energy and self-sacrifice to be obtained from all ranks of the force engaged.

In the war in New Zealand, the difference of the operations conducted with Queen's troops and those where colonial troops, aided by friendly natives, were engaged, showed painfully that our troops have much to learn in the art of fighting against savages. Our care of our troops occasionally is excessive, and naturally opposed to quick movements. In that war, a force of colonial troops and a friendly native contingent under Lieutenant Biggs went to attack the rebels at Kawa Kawa, and the rapidity and efficiency of their operations far surpassed anything that was done by the regulars during the war. Mr. Fox relates that after a long march, as the evening closed in, some of the men became disturbed at the want of provisions. He says: "About this time, some of the men are said to have asked the, under the circumstances, not unreasonable question, 'Where are we to sleep to-night?' Upon which Lieutenant Biggs is reported to have pointed to the pah ahead, and said that they had to 'make

themselves quarters there,' which they did, driving the enemy out in gallant style."

The strength of our Home Transport is very small, and even during autumn manœuvres, its movements, in a country like England, are ill-suited to afford any instruction as to the requirements of an army making long marches through a difficult and poor country. This can only be obtained by personal observation, by collecting information from military despatches, departmental reports, and a careful study of the narratives of our expeditions and wars. Even these last are generally wanting in many interesting details which would only prove tedious to the general reader. The passages relating to transport and other matters of administration are few, and scattered throughout the books, and require patience and time to collect.

The raising of a transport corps at a short notice (for in many of the countries in which we may have to make war a new corps entirely will have to be raised) will always be a difficult undertaking; but the difficulty will be very much overcome by an attentive study of our former wars and expeditions, which will show how, by adopting a certain organization and following some fixed principles and rules, may be avoided the breaking down of our transport, which has occurred in many of our former military undertakings.

Such undeniable military authorities as Napoleon, the Duke of Wellington, Sir Charles Napier, &c., have all been in favour of a disciplined military transport. Speaking of the first, Marshal de St. Arnaud says: "The Emperor made up his mind, and the experience of a long war confirmed this conviction, that it is indispensable that armies should have a train organized on an exclusively military principle."

Sir Charles Napier says: "I am convinced . . . . that the baggage of an army can never be rendered properly movable, even in Europe or America, still less in India, unless it is formed into a corps perfectly organized." Later on, Lord Strathnairn, on a report on transport, has the following words:—"I beg leave to record my convictions, founded on practical experience in India and the Crimea, and a careful study of all the bearings of military transport, that the idea of organizing a 'Train' of which all the elements would not be under military discipline is a fatal illusion."

A civil transport is condemned by most of the principal military authorities, who agree that the transport moving with the army should be a well-disciplined corps. This discipline, or the subjection to rules, order, and regulations, can only be obtained by giving the transport with the army a certain military organization. The regularity of any large body on the march is only obtained by

practice, and by conforming to certain rules carefully laid down for all ranks. This practice forms a part of our drill, and to obtain the same regularity in the long transport columns, which encumber the rear of a moving army, certain fixed rules must be framed and observed, and these could only be observed by a body accustomed to discipline and obedience.

A civil transport is liable to panics, and requires a large number of troops to escort it. Civil labour is also costly; it is, besides, a great object to obtain the actual control discipline holds over the soldier, which is not to be got from the civilians of the lower classes.

See Appendi

An army in the field requires two kinds of transport; each, working under different circumstances, will differ greatly in its constitution.

The first is that portion of the transport which moves with the army itself. It conveys the regimental baggage, camp equipage, reserve ammunition, removes the sick and wounded, and brings forward supplies for men and animals for a limited number of days. This portion, which is intimately connected with the troops, requires, by the admission of the highest military authorities, to have a military organization.

The second moves in rear of the active zone of operations; it pushes forward the supplies of the army from the base to the most advanced magazines, and is generally out of reach of attack

from the enemy. A military organization for this would be superfluous, and it generally will be found composed of auxiliary or indigenous companies.

In a matter of such vital importance as Army Transport, on which so much depends in actual war, the vexed point as to whether it ought to form a separate department for itself under the orders of the Quarter Master General, or to be placed entirely under the sole control of the Commissariat Department, should be carefully considered.

Several weighty arguments are adduced by the advocates of both plans. These ought to receive the attention they demand, and ought to be considered in an impartial spirit for the good of the service, for the matter is of such grave importance that an early solution of the question will facilitate matters greatly on the breaking out of a war.

A certain amount of friction has been experienced in some of our wars by the placing of the late Military Train under the orders of the Commissariat Department. The officers of this department state that military men looked at their being placed under the Commissariat Department as a source of grievance, from which ensued evident passive resistance and want of cordial co-operation.

This complaint of want of cordial co-operation

is not limited entirely to the officers of the army, but in reports on the Crimean, China, and New Zealand Wars the officers of the navy or naval transports have been accused of the same.

On the other hand, in the reports of Commissariat Officers one cannot fail to notice a latent jealousy of the military rank possessed by the officers of the Military Train, and a certain amount of sensitiveness regarding their own position as non-combatant officers.

It is often stated that in the French army this feeling of want of co-operation between the Military and the Intendance or administrative branch does not exist. There is, however, one very important difference in the constitution of the French Intendance from our Commissariat, which seems to be generally lost sight of, and that is, that the officers of the Intendance are recruited from the army, from officers not under the rank of Captain, the preference being given to those of the Staff Corps; the tone of the department is very good, as most of the officers are former *élèves* of the Ecole Polytechnique and of St. Cyr. No feeling of the nature described above can therefore exist in the French service, any more than in the Indian service, where the Commissariat is entirely officered by commissioned officers from the army. The committee of officers sent to report on the French Intendance in 1855 remark: "The French attach

great importance to the maintenance of the principle that all the adminstrators of the army should be chosen from among military officers; they consider that such a regulation tends to produce harmony in the working of the military system."

Commissary General Turner, in forwarding Assistant Commissary General Robinson's report on the campaign in the north of China says: "It is folly to blink the fact that, as a rule of almost universal application, military officers will not work under the direction of the civil departments of the army in the spirit which is indispensable to success in a matter so critical and peculiar as the supply of an army." However, he remarks on Assistant Commissary General Bailey's report on the transport service in the same campaign, that that officer had "over-estimated the passive resistance and the want of co-operation on the part of the officers of the military train," of which he complained. In the following campaign Deputy Commissary General Bailey, in his report on the services performed by the transport in New Zealand, acknowledges the hearty co-operation he received from all, and states how at all times they cheerfully performed the work allotted to them. The transport was composed in this case of officers and men of the Imperial forces and Colonial Militia, and the names of several officers of the line are brought to the

notice of the Lieutenant-General Commanding at the conclusion of his report.

That any feeling of the kind complained of by Commissary General Turner should exist on the part of the military officers is much to be deplored, for a very important reason, viz. that, as he shows, "the Commissariat cannot afford sufficient officers for this (transport) service;" and combatant officers accustomed to duties of routine and enforcing discipline in the ranks, and by the nature of their duties being better fitted than any others in looking after transport on the line of march and in the lines, will invariably be required for the increased cadres of the transport corps on service.

To raise a large Transport Corps abroad, which will always be the case with us on account of our insular position, is a matter demanding the attention of a large staff of officers.

At the outbreak of hostilities, the Commissariat is the branch of the service which, above all others, is taxed with heavy duties and severe work. The small contracts and minutiæ of routine service give way to contracts on a large scale, extensive surveys, issues, shipments and despatches of stores of all kinds, preparations of indents, correspondence, &c. The work at first is immense, and, being out of the usual routine, embarrassing, and calls for the undivided attention of every officer of the Department. This is

the very time when a transport, on a scale adequate to the requirements of the force placed in the field, is to be raised, as a general rule, away from home; and it seems as if it would greatly relieve the officers of this Department to make use of officers of Cavalry, Artillery, and even Infantry, for this purpose, at this pressing juncture.

Amongst the other causes affecting the failure of the Commissariat in the Crimea was advanced the reduction of the department from motives of economy.* Is the Commissariat of such a strength now in officers to meet the requirements of a large European war, both in the supply and transport departments? In the campaign in New Zealand, for 15,017 men, the return on the 1st May, 1864, shows 23 Commissariat Officers, 9 Military Store, and 5 Purveyor, besides 19 Military Train Officers and 32 of the Transport Corps. With the small force in the Ashantee War there were no less than 27 Officers of the Control Department.

The Commissariat Officers argue that their Department, being the great contracting party of the Military Service, and having charge of the funds of the army, are better fitted to effect the extensive operations of providing the means of

* In the Crimean war there were 234 Commissariat Officers employed.

transport, and to account for the funds expended in them than military officers. However, during the Crimean War, where a different course was adopted in forming the Land Transport Corps, we have the testimony of General McMurdo that military officers sent to effect purchases of horses and mules were by far the most efficient. They were, as we shall show hereafter, assisted in their labours by agents and accountants provided by the War Department.

The demands of the Commissariat for the entire and independent management of all transport are as follows; and, to enable a ready comparison of the arguments adduced against the adoption of this course, the demands and objections are arranged side by side.

The foreign armies have organized an essentially military transport based on the opinions of the best military judges. By this military organization and training the transport is capable of maintaining order upon the line of march, of conforming to the movements of the troops in their front, and adopting certain formations for repulsing attacks made upon its convoys. This organization demands that a military officer be placed at the head of the transport.

The Commissary General, or other officer who may be responsible for the feeding of the troops, must have unrestricted control of all transport.

Though the Commissariat requires a large proportion of the transport of the army in war time, other departments of the service require transport also, and there is nothing in the special duties of the Commissariat to give it any peculiar claim to, or qualification for, the organization and management of a corps of military drivers. The completing of each branch of the service with its means of locomotion makes it ready at any moment it may be called upon to move. Commanding Officers, knowing that they have solely to depend on the transport placed under their charge, will be very careful that it is properly looked after and always efficient. It must also be an undoubted advantage for regiments to have always the same transport, as a spirit of *camaraderie* will spring up between the men

The Commissariat requires the largest portion of the whole transport of the army. Requiring as it does the larger portion of the transport, this Department would have most interest in its completeness and sufficiency. It requires, besides, absolute regularity and punctuality in the service, as supplies of food and forage are indispensable conditions of military success. Transport detailed for other than Commissariat purposes would be inactive for long periods together; but if placed under its control, the Commissariat would provide transport for any but Commissariat duties, when required, at other times using it for its own requirements, thus causing economy of transport. One Commissariat Officer states that in the campaign in North China he estimated that he obtained an additional one-third of transport by this arrangement.

and the soldiers, which cannot but prove beneficial.*

It is just as much in the power of the Director of Transport as of the Commissary General to direct, under the sanction of the General Commanding, the employment of all stationary transport for Commissariat or other army purposes. This can be done better as the Quarter Master General (under whose orders is the Director), being in the confidence of the General Commanding, can with greater certainty point out what portion of the stationary transport is not immediately required and can be diverted to other uses. Troops on service do not all require the same amount of transport; some—for example, those guarding a post on the line of communication—may require none at all; others, close to a depôt of supplies, will require less than the troops further away. All that is superfluous, though forming part of the establishment, would be withheld until actually required. It is impossible to place the Regimental Transport always at the disposal of the Commissariat; part of it must remain always inactive in expectation of any sudden order to move, which, on service, may come at any moment, particularly when within striking distance of an enemy.

* The drivers of Regimental Transport should be, as a rule, from our own people, as soldiers are prone to look down on foreigners and treat them roughly.

To obviate this objection, it has been suggested to make the Commissariat independent in the matter of transport, by having two separate bodies — one to have charge of the ammunition, regimental baggage, sick and wounded, and, in short, anything that would be brought under fire; the other to be a proper establishment for the Commissariat, and entirely independent. Having two separate trains on the line of march, separately commanded and with separate interests, would cause no end of confusion and disorder, and this suggestion does not seem at all practicable. Transport, whether as a department by itself or under the Commissariat, must be all one.

It is practically wrong for the Commissariat to depend upon any separate branch for its transport. The whole means of collection, custody, and delivery of supplies should be centred in one and the same department.

It appears that the friction caused by the want of cordial co-operation between the Military Train and Commissariat formerly arose from both not understanding the limit of the duties under which they worked. That of the Transport Officer only extends to the discipline of his detachment, the efficiency of the means of conveyance, the proper

The military organization of the transport might in practice be prejudicial to the authority of the Commissariat Officer in his own department. On an emergency military officers have shown a decided preference to comply with military demands, to the detriment of those of the Commissariat.

adjustment of the loads, and the protection of the stores entrusted to his charge. The Commissariat (or other officer who makes the requisition for transport) possesses control over its movements for the performance of the service for which it is required, taking due care that it is not unnecessarily detained. The absence of the dreaded friction will depend on the efficiency of the military supervision, and principally on the Director of the Transport. *See Appendi*

Line Officers employed on transport duties in the wars in New Zealand, Abyssinia, and Ashantee have earned a reputation for hard working and the cheerful way in which they carried out their duties, which often were very onerous. The officers for filling up the cadres of the transport in war will be principally volunteers, and such generally turn out the best workers. As long as an officer is a Transport Officer, it appears he should not be permitted to assume command over any of the troops, in any position whatever. He joins the transport, either by order or as a volunteer, and should strictly confine himself to transport duties as long as he is attached to that branch of the service. For the Commissariat to apprehend that because the officer does not belong to his own department he will not carry out his duties in a fair and impartial way, would be to ignore entirely the superior officer under whose immediate orders the Transport Officers are serving.

The amount of transport for Commissariat service is an unknown quantity; all other transport can be easily calculated. Wherever there is a Commissariat Officer, he must be alive to the chances to be profited by, and of failures to be provided against; and unless he has a Transport Officer for his shadow the opportunities for either must be lost.

It is one of the duties of the Transport Department not only to look after the transport with the army itself, but to procure it from all available sources, and form depôts of reserve to meet this changing quantity.

Colonel McMurdo, in his memorandum of the 4th May, 1859, says:

"I am therefore of opinion—

"1*st*. That the operations of the Land Transport Department ought not to be limited to the immediate vicinity of the army in the field, but should extend throughout the lines of communication to the base.

"2*nd*. That, consequently, its organization in war should consist of two branches; viz., the regular military train, and irregular auxiliary companies, or the hired transport of the country.

"3*rd*. That the functions of purchasing or hiring the means of transport requisite for the above services should be vested in the Department of Transport.

"4*th*. That, as regards the means for collecting supplies into depôt by the Commissariat, that Department should be authorized to take up and employ local transport for the purpose; and that

this should be done in conjunction with the head of the Transport Department, in order that the transport so employed by the Commissariat may not be interfered with in the general levy."

It is argued by the advocates of a separate corps under the orders of the Quarter Master General (the officer who superintends all the details of the movements of troops by land and sea) that a separate Transport Department, to which should be attached the duties of purchasing and hiring the means of transport requisite for the army, the formation of depôts, &c., means division of labour, as inducing "simplicity, which is the parent of order, rapidity, and vigour in war." That on the Transport Corps being organized, certain divisions of it would be detailed for Commissariat purposes, supplemented or reinforced from the reserve depôts as necessities arise. These divisions would be used for no other purpose whatever (other portions of the transport having at the same time been detailed for the other requirements of the army); these would form the transport establishment demanded by the Commissariat, and be solely at the disposal of that Department, the Transport Officers of these being only responsible for the discipline, efficiency, and order in camp and on the line of march, otherwise conforming to the instructions

they receive from the senior Commissariat Officer.

The nature of transport duties, which include the daily supervision of an immense establishment of men, animals, and materials; the maintenance of the organization of the corps through the many difficulties which are sure to arise during active service; the training, keeping at work, and replacing of thousands of animals; the keeping up of different establishments, on account of the variety of animals used for transport; the daily routine of duty, instruction, payment, rationing, inspecting, &c., of thousands of attendants, often of different nationalities, and at times not of the best character; the repairs of harness, saddlery, wagons, &c.;—the supervision of these onerous duties seems to demand being placed in the hands of an officer unfettered by any other duties whatsoever, that the establishment may be maintained in thorough working order, and its efficiency not questioned at any moment.

The question of transport also is closely connected with that of communication, and in cases of exigency, where the disposal of transport and the regulation of its movement, in certain circumstances, is affected by military considerations, it is of great consequence that it should be under the direction of a military officer.

The strongest argument brought forward by

the officers of the Commissariat for claiming the unrestricted control of the transport is that, as the supplies of an army are wholly dependent on transport, the transport should be placed under the sole command of the senior Commissariat Officer. This unrestricted control of the transport seems to be rather an exaggerated demand, and it has often been remarked by officers of long service and experience that the officers of the Commissariat Department claim a certain degree of independence from the General Staff, which the nature of the military service does not appear to warrant.

The following words occur in a despatch by Commissary General Jones to the War Office, dated 6th September, 1865:—

"And lastly, I consider that the Commissary General ought to have the power of conveying to the army, in general orders (unquestioned by the Adjutant General and Quarter Master General), his directions connected with finance, supplies, and transport, in precisely the same way as the Adjutant General does for the *personnel*, and the Quarter Master General for the *matériel*, of the army; taking his instruction for such duties direct from the General Commanding, in the same way as those officers do in their respective departments."

It appears that every sacrifice, in fact, should be made, and every means given, to secure the

success of the Commissariat Service; as if every General Commanding would not be anxious to obtain this, however subordinate to other serious military considerations.

The General Officer, being the person most interested and responsible for the success of the operations entrusted to him, will be the first to authorize all unemployed transport to be utilized to forward supplies and other necessaries for his troops. As examples of this, in the last two expeditions we have been engaged in, we see Sir Robert Napier in Abyssinia reducing to a minimum the baggage and camp equipage of his officers and men to increase his means of transport for supplies; and in the expedition to Ashantee, Sir Garnet Wolseley employing most of the troops he had on the Prah as carriers, to supplement his insufficient means of carriage.

After all the arguments adduced in favour of the transport and supplies being both placed under charge of the Commissariat, after the Committee had issued their report on the administration of the Transport and Supply Departments of the army, we find in the only two expeditions we have sent out since, to Abyssinia and to the Gold Coast, the transport at the end of the campaign under the direction of a military officer, and not of the Commissariat.

This is strong practical evidence that some of

our military authorities do not endorse the claims set forth by the officers of the Commissariat Department, and are still in favour of the Land Transport Service being a separate department, under the control of the Quarter Master General.

When a large force was in Canada, after the *Trent* affair, it was urged in favour of placing the Transport under the Commissariat, "that no other department could watch and prepare for casualties or work so indefatigably as the most interested (and responsible); that to the Military Train Commissariat supplies might be a very secondary consideration, to the Commissariat they would be the first; and to the Army, subsistence is of too vital importance to be entrusted to any department but that which, being solely responsible for it, would make it its chief duty."

The transport of supplies, in which the Commissariat claim to be the most interested, is but one branch of the entire transport of the army. The Quarter Master General is the officer who, above all others, assists a General Officer in regulating all the movements of the army. As the army cannot move without transport, he naturally becomes (always after the General Commanding, who is the responsible person for handling and subsisting the troops) *the officer most interested in the sufficiency and efficiency of*

the entire transport. He must be thoroughly cognizant at all times of the state and distribution of the transport, and, as far as strategical movements go, the transport must be under his direction. He has no interest in the success of any particular department of the service; to him the success of the whole is of paramount consideration; and, notwithstanding the arguments adduced by the officers of the Commissariat Department, it appears that of the two he is the officer best fitted to provide for the economical use and employment of the transport of the army.

It is not intended to increase the already immense work that falls to the lot of the Quarter Master General on service by placing the transport under his charge. A Director of Military Transport relieves him of all the working of the corps, keeps him correctly informed of the daily employment of its various parts, and receives his instructions regarding the requirements of the army in all matters of transport.

It appears to be generally admitted, first, that the portion of the transport moving with an army requires a military organization; second, that the entire transport, which comprises—

1. Regimental transport, in charge of Commanding Officers;
2. Reserve ammunition, in charge of the Artillery;

2 ~~3.~~ Field Hospitals and Ambulances, in charge of the Medical Officers;

3 ~~4.~~ Supplies, in charge of the Commissariat—

should be constituted as one body, under one direction, and should extend throughout the lines of communication to the base. *See Appendix*

The Army Transport Corps should supply the various branches of the army with drivers, animals, and carriages, and should provide besides the Officers and Non-commissioned Officers for the Auxiliary Transport, so that one system under one direction may be carried out throughout the entire transport of the Army.

Some officers are of opinion that any man is good enough for the transport, and that men whose diminutive stature unfits them for the ranks, can be utilized as drivers; but a Transport Corps man requires to be robust and able to lift and adjust heavy loads, and tend his animal at the end of a long fatiguing journey. In the train columns, moving in rear of the army, the service is very severe, and the Germans found in the last war that the wear and tear of the transport in men and animals was very considerable. A certain *physique* must therefore be looked for in enlisting men for the service, which is often not to be found in men of very low stature.

One of the most striking alterations introduced in the organization of the German armies

in their late wars was the entire separation of the fighting force from the troops detailed to guard the line of communication—a most important improvement, when we bear in mind how the numerical strength of an army used in former times to be continually reduced during an advance, by having to leave more or less strong detachments at various important places in the rear, where depôts, magazines, hospitals, &c., were established on the road by which the army communicated with its base.

Great attention in future will be paid to the line of communication, and the troops to guard this line will consist of a body of the three arms complete in itself, under the command of a superior officer, who will be charged with the protection of the line, the administration of the country occupied, the supervision of the various services to which the army must look for all it requires during a campaign in the way of reinforcements of men and horses, provisions, ammunition, and other military stores, and the removal of the sick and wounded.

These various services embrace, amongst others, transport of all kinds, including railways, for the supply of the *matériel*, provisions, and stores, removal of sick and wounded, reinforcements, the construction and repairs of telegraph lines, and postal arrangements. This transport

will form the second line of transport,* and will be charged to convey all that is required for the army from the base to the most advanced magazines. From this point the first line of transport, divided into departmental and regimental, will divide amongst themselves the remainder of the duties; the first working up to the divisional depôts, and the last from these points up to the regiments and corps at the front.

Thus the impedimenta of an army will be immensely reduced, nothing but what is actually necessary being with the army in front. The departmental work will be carried out in rear, under the direction of the officer in charge of the line of communication, who will generally remain one day's march behind the head-quarters of the army, and who will be assisted by Staff Officers, to look after the troops detached for the protection of the line of communication; by Police Officers with a body of military police, to inquire into the disposition of the inhabitants and prevent any disturbance along the line; by civil functionaries, to administer the occupied provinces; by Commissariat Officers, to look after supplies and stores; by Surgeons, for the

* The second line of transport, on account of the variety of the services it has to attend to, the continual stream of supplies and reinforcements moving up to the front, &c., requires to be formed on a large scale, and is by far the largest portion of the whole transport of an army.

supervision of hospitals and the removal of the sick and wounded; by a Railway Director, to manage the railway lines and effect all necessary repairs; by a Transport Officer, to arrange for all carriage in excess of that furnished by railways; and finally, by Postal and Telegraph Officers, to work the details of those departments.

HOME AND INDIAN TRANSPORT,

AND STEPS TAKEN TO PROVIDE A TRANSPORT CORPS IN SOME OF OUR FORMER WARS.

The available transport at home consists of twelve troops of the Army Service Corps, with wagons.

For want of sufficient transport during the autumn manœuvres, Horse Artillery have been employed in horsing wagons, and formed into an Auxiliary Transport.

Troop horses have also been used to draw the wagons for Cavalry Regiments, but this plan did not meet with the approval of many Cavalry Officers of experience, the animals being generally unsuited for draught.

These are only makeshifts during peace manœuvres, in time of war not to be resorted to, as it is necessary then to keep every battalion and squadron at its proper established strength.

To make up for our deficient transport, a large number of vehicles, of all shapes and descriptions, were hurriedly hired during the autumn manœuvres of 1871 and 1872. No attempt, therefore, could be made to introduce any organization into this kind of transport, and of this our

officers and the nation at large did not feel very proud.

In the autumn manœuvres of the last few years officers and men from Line Regiments have also been sent to Woolwich and Aldershot to be trained for transport duties, and in 1872 the regimental transport system was thoroughly tried.

In the following manœuvres was tried the system of providing transport for only one-half of the force, and transferring it to each half, from day to day, as it became necessary. It is plain that this plan, evidently devised for purposes of economy, could afford little instruction in the matter of transport.

Our Transport Corps at home is no school for the duties to be performed by that branch of the service in war. The roads are good; the description of wagons used is very heavy; built with the principal object of their lasting for a number of years, these are totally unfit to be used on the bad roads over which our troops have generally to march, and are unsuited for the small horses we can purchase abroad. Our expeditions are mostly carried out in India or the adjoining countries, and in these our Army Service Corps is not called upon to serve. The transport duties at home (with the exception of the season for manœuvres) are very light, and the Transport Officers have no opportunity of acquir-

ing any instruction in the extensive requirements of their branch of the service in actual war.

The twelve transport companies of the Army Service Corps are distributed for duty between the stations of Woolwich, Chatham, Portsmouth, the Curragh, and Aldershot; the strength of each is 3 officers, 133 non-commissioned officers and rank and file, with 91 horses. The twelve companies, therefore, represent a total strength of 36 officers, 1596 non-commissioned officers and rank and file, and 1092 horses. The companies are so arranged with regard to officers and non-commissioned officers that there are sufficient in each company to expand it into two on active service. Taking the rank and file of each company at 121, the strength of the corps on service would amount to 36 officers, 144 non-commissioned officers, and 2904 rank and file, with 1960 horses, exclusive of those ridden by the officers and non-commissioned officers. Were the whole of the twenty-four companies to proceed on service, without leaving any at home to meet any contingency that might occur elsewhere away from the theatre of war, we should still be a couple of hundred horses short of the transport required for a single Army Corps. The Army Corps tables take no account of provision columns, carriage of stores, &c., for which a large quantity of transport is also required.

See Appen

In the Crimean War it was estimated that over 20,000 transport animals were required for our army of 30,000 men to take the field with efficiency: this will show what expansion of the present corps would be necessary on service. Of this number, of course, a large portion would belong to the second line of transport; again, operating in a country traversed by railroads, the numbers of animals would bear a considerable reduction; but until our soldiers are made to carry a certain amount of provisions on service, can be made to thrive on the preserved provisions consumed by the soldiers of continental armies, and can dispense with tents, our transport will remain out of all proportion to the number of the troops in the field.

The relations with our subjects and neighbouring rulers in India are such as to demand means for moving troops at the shortest notice; for this purpose a certain quantity of transport is always kept up in the Indian Army, and is known as the moveable column carriage. It is calculated that it has the effect, by giving the troops more mobility, of reducing the number required for the effective occupation of that country.

Of the Indian Transport men, Sir Hugh Rose, in his memorandum dated Poona, January 9th, 1860, says: "The camel, elephant, bullock drivers, in short the men of the 'Train,' from being all undisciplined and unorganized, com-

promise the safety, credit, and discipline of the army by the commission of every description of disorder and outrage, for which in India they are proverbial.

"They render hostile to the troops the inhabitants of the country by ill-using and plundering them, thereby endangering our communications, supplies, and means of information.

"They give the worst example to the soldiers."

Lieutenant Collen, Royal Artillery, in a lecture on the Military Transport and Supply of India, gives some details of the strength of the transport kept up in that country, and from him we learn what amount of it is required to move the different arms of the service.

According to him, the present scale of moveable columns was fixed in 1861, and for Bengal may be taken as constituting a force of—

9 Batteries, or 54 guns, with the first line of wagons,
6 Squadrons British Cavalry,
9 Squadrons Native do.,
9 Battalions British Infantry,
12 Battalions Native do.

"The largest column in Bengal consists of—

1 Battery Artillery,
1 Regiment British Infantry,
1½ Regiment Native do.,
1 Regiment Native Cavalry.

"The smallest of all arms of—

½ Battery Artillery,
½ Battalion British Infantry,
½ Battalion Native do.,
1 Squadron Native Cavalry.

"In Bengal there are twenty-three moveable columns; and if we estimate those in Madras and Bombay together at one-third of the Bengal strength, we would have approximately a force of—

12 Batteries,
8 Squadrons British Cavalry,
12 Squadrons Native do.,
12 Battalions British Infantry,
16 Battalions Native do.;

or, in other words, transport is provided for a force equal to an Army Corps of 72 guns, 28 Battalions of Infantry, and 20 Squadrons of Cavalry.

"In the Bengal Presidency the authorized Transport Establishment is, speaking approximately, 1000 elephants, 6600 camels, 350 pack bullocks, 530 draught bullocks, and 1500 mules.

"It will, however, give an idea of the transport necessary in India if I state that a Regiment of British Infantry equipped on this moveable column scale requires about 41 elephants, and 280 camels; a Battery of Artillery, 10 elephants and 74 camels; a Squadron of British Cavalry, 7 or 8 elephants and 66 camels; a Regi-

ment of Native Infantry, 112 camels; and a Squadron of Native Cavalry, 9 camels."

Seven days' supply of food for the numbers composing each moveable column is always kept in store by the Commissariat; the amount of rations conveyed with troops is seven days for Europeans, two days for Natives, and two for horses.

These moveable columns are distributed all over the extensive territories of British India. The concentration of the transport kept up for their use, to be applied to any particular purpose, is impossible, as long as the necessity for keeping these columns ready to move at the shortest notice exists.

The Native Cavalry require less transport than any other body in India, as each two troopers are bound to keep up at all times a pony for the transport of their tent, baggage, and personal property.

Each regiment of the Punjab Frontier Force maintains a permanent cattle establishment of fifty-five camels and forty mules for the transport of its regimental baggage, and moves annually into camp to practice Light Infantry movements on the hillside. The regulations point out that "the design of the order is not only to accustom the men to drill on the hillside and over rough and broken ground, but also to give Commanding Officers the opportunity of organizing and con-

trolling the baggage, camp equipage, public carriage, and hospital establishments of their regiments."

We have shown what the nucleus is of the transport kept up both in India and at home; from the expansion of either of these would, no doubt, be formed a Transport Corps for our army in the East or elsewhere. It would be too expensive to keep up a transport on a large scale in time of peace, but what is kept up should be so organized as to be able to be rapidly augmented without in any way injuring its efficiency.

Many of our wars and expeditions have been as near failing as possible owing to insufficient or badly-organized transport.

The confusion and disorder in the early part of the Abyssinian Expedition will be dwelt upon hereafter, when mules were landed without even a halter to picket them with. In the Looshai Expedition, in the words of the Officer Commanding the Cachar Coolie Corps, "a state of uncertainty and confusion lasted until the force had commenced its retreat." As late as the Ashantee Expedition, the 2nd West India Regiment and Native levies, about the only troops on the Prah, were turned into carriers, and a portion of the British troops were left on board ship, owing to insufficient available carriage.

In several of our expeditions in India and in the one to Abyssinia the blame of the want of

organization in the Transport Corps could not attach to the military officers, for the Civil authorities, unacquainted by want of experience of how entirely final success in war depends on the transport, were deaf to the warnings of the military officers, and even opposed the measures they suggested.

In the Sittana Expedition, Sir H. Rose warned the Indian Government that considerable preparations were necessary for the due equipment of a force of 5000 men intended to enter a hostile, difficult, and unknown country, as regards supplies, transport, ammunition, &c., and the time to prepare the expedition was insufficient.

Sir J. Adye, in his account of this war, remarks: "The Lahore Government, indeed, authorized the hire of camels and pack mules in considerable numbers, as best adapted for the contingency; but the mere hasty collection of animals never can constitute an effective transport."

The result of this was that "the obstructions in the road, the great amount and inferior nature of the transport, and the incompetence of the drivers, caused serious delay."

When the Abyssinian Expedition was determined on, Sir Robert Napier submitted to the Bombay Government the details for the organization of a Transport Corps. These did not

meet with approval, and his scheme had to give way, and was replaced by an organization sanctioned by the Civil authorities. However, the marked contrast between the efficiency of the Lahore Mule Train on its arrival in Africa, and the confusion and disorder, at first, of the rest of the Transport Corps, shows how correct Sir R. Napier's views were from the very beginning.

The Lahore Mule Train was raised by Captain A. G. Ross, Bengal Staff Corps, at Lahore, in the Punjab, in September, 1867, for service in Abyssinia. Though the drivers were not enlisted men, but simply hired followers, certain military habits and customs were introduced into the Train from its first formation. These, enforced during a long march to Kurrachee, where the train was embarked, rendered it a disciplined body, and made it efficient from the beginning to the end of the campaign.*

Again: The organization submitted by Lord Napier for the Transport Corps for the Looshai Expedition was not approved by the Government of India, though here again the soundness of his views was shown by subsequent events.

All cases of extraordinary expenditure are referred to the Civil administrators. These,

* The efficiency of the Chinese Coolie Corps in the Expedition to North China of 1860 was due to the corps being efficiently officered, well organized, and to the coolies having become well familiarized with their work before the corps actually took the field.

considering them as likely to effect the prosperity of the country in their charge, often deprive the Generals of the means which in war are his rights; for a General has as great a right to be supplied with an efficient and sufficient transport as with troops to fight with, so much of the ultimate success depending upon it. Were he not an officer of ability and experience, it is hardly to be supposed he would be placed in a responsible position. This gives weight to his opinions, which should receive consideration from people who have not experienced any of the many difficulties that encompass a war or distant expedition.

All wars are expensive undertakings, and much more so with us, who are often compelled to wage them at a great distance from home, and against savage, poor nations, from whom even a fraction of the expenses of the war cannot be recovered.

To make war on economical principles is quite right, but to cramp a leader in one of the principal means of conducting it to a speedy and successful termination, is to increase the already numerous difficulties which beset the General of an army, and which are sure to endanger its ultimate success.

The strain of mind on a General during a campaign is very considerable; and it is not saying too much that the anxiety engendered

by the want of proper means for conducting the war may often cause the abandonment of some brilliant conception, and give a character of mediocrity to the whole operations.

The pressing of animals, carts, &c., for a war or expedition will undoubtedly affect the agricultural prospects of a country. If the war is carried out in an enemy's country, the consideration of this result may possibly, amongst many others, bring the enemy to terms; but where the carriage is pressed in one's own country, owing to the impossibility of obtaining it in the invaded territory, the future consequence of such pressing must be seriously considered. Purchasing will be preferable, though the above difficulty is by no means solved by adopting this plan. In this case, however, the owners part with their property willingly and receive compensation for it, which deprives them of any reason for discontent in future. The carriage is your own, and you can dispose of it as you like. The same applies to drivers; if enlisted of their own free will instead of pressed, they will work better, for a pressed man is an unwilling man and works badly. With enlisted men you can also introduce any system of discipline you may think necessary to adopt.

Before inquiring into the transport arrangements that have been made in our past wars

and expeditions, it will be well to examine the system pursued in India, the country in which many of our wars have taken place, and from which several important expeditions have been fitted out for operations many miles away from its shores.

The Commissariat is the great Supply Department of India; it is the only Department authorized to incur expenditure for the purchase of stores and materials, procuring all those suitable for the service that can be purchased in that country. It obtains, either by purchase or by contract, everything required by the army, and provides all departments with such stores as they may need.

The Commissariat keeps no stores besides those required for rationing the troops, feeding the horses, and supplying the hospitals.

The officers are military officers who rise in the different grades of the Department, but do not relinquish their military rank, and attain promotion to the various ranks like the rest of the officers of the Indian Army.

The Commissariat may be said to be the head of the Transport Department in India, for it has charge of the small establishment of hired cattle maintained for transport purposes in time of peace. These small establishments require to be very largely increased whenever the necessities of the State call large bodies of

troops into the field. It is then that the advantage of maintaining a small quantity of transport in time of peace becomes apparent, for it facilitates the extension of the transport, the contractors coming readily forward with further supplies. All the departments, then, look to the Commissary General to enter into contracts for purchasing or hiring the additional cattle required; but the Commander-in-Chief has virtually, through the Officers commanding Divisions and others, control over the cattle and drivers told off for the various services of the army, the Commissariat only acting as agents employed to contract for transport.

The Indian Commissariat possesses great influence, and in its exertions to obtain carriage receives great assistance from the Civil and Political Officers of the country, who bring their authority to bear on the people. The system of employing this Department to obtain carriage and supplies originated from motives of economy. The contractors for carriage are also men of influence and wealth, and through them the Commissariat is able to obtain the large amount of supplies required for troops on service. On the point of supplies, it should be observed that the followers, both public and private, often amount to from three to five times the number of the fighting men, and in some cases require to be fed, as well as the combatants.

In Sir Charles Napier's operations in Cutchee, a most wild and difficult country, though the fighting men did not amount to more than 5000 men, "no less than 20,000 persons and their innumerable animals were to be provided for and handled amidst those barren rocks." (Sir C. Napier's *Administration of Scinde.*)

Most of the transport for the army in India is done by pack animals. This kind of transport, which was very suitable in the early years of British conquest, owing to the want of good roads and means of communication, is maintained up to the present time; though a number of excellent roads for wheel carriages now intersect the whole country, and many even of the secondary roads are well fitted for carts of a light description in the fine dry months of the year, the months in which military operations and movements of troops generally take place.

The substitution of wheel carriage for the present pack animals would be an immense increase in the power of the Indian Transport, though there is no doubt that such animals as camels and elephants are well suited to carry the large and cumbersome tents used by the European troops.

The Indian Transport is purely a Civil Transport, with no attempt at organization or subdivision into regular fractions, and on the line

of march the various parts move independently, without following each other in any particular order; thus the Indian armies are followed by a confused mass of baggage animals and followers extending for a long way in the rear of the troops; this seriously hampers the freedom of their movements, and has made the progress of our armies proverbially slow.

The Indian Commissariat, with all its good points, has not as yet exercised that supervision of the transport of the army on the line of march so very essential in war. It has provided the animals required, it has arranged for their being fed (a difficult question, no doubt), it has replaced the animals lost or incapacitated; but there its work, so far as the transport is concerned, has ceased. It has not introduced any organization by which its movements on service might be rendered orderly; it has neither divided the duties of its officers into transport and supply—perhaps for the reason that its strength in officers was not sufficient to allow them to attend only to one section of their duties.

That the Indian Transport is capable of becoming an organized and orderly body, the result of the organization introduced in the Lahore Mule Train in Abyssinia is a very striking proof. Other examples are not wanting, for, as early as 1844–45, Sir Charles Napier in Scinde gave a

military organization to his transport; this was again revived when a Bombay column, under Sir D. Dundas (better known later as Lord Melville), was despatched to co-operate with the troops besieging Mooltan. It may be urged that it was the duty of the military authorities to introduce the required organization into the transport, but this could only be introduced gradually and by degrees in time of peace, in the small establishments kept up by the Commissariat, and not suddenly on service, in the large masses of which generally our transport was constituted. The required organization need not be carried too far, but should provide against desertions and loss of animals, ensure a cheerful obedience of orders and the performance of their calling by the drivers, their orderly movements on the line of march, and the abstention from committing disorder and outrages, or ill-using and oppressing the inhabitants of the country the army marches through.

Sir Charles Napier when Governor of Scinde introduced a military organization of the transport animals, to guard against the baggage being any longer a confused host of men and animals, and principally to provide against desertions, disorder, and the breaking down of the finest combinations which invariably occurred when the baggage animals were hired and the drivers undisciplined.

He divided the camels into divisions of 600 each, the animals being the property of Government, the drivers enlisted men, disciplined, armed, and drilled as soldiers, and commanded by regular officers. The men were clothed in uniform, and each division had a directing animal on which was carried a flag by day and a lantern by night; the flag, the light, the trappings of the camels, and the uniform of the drivers of each division, all corresponded. The animals were classed as strong and weak, and bore round their necks tablets to show the maximum load of their class. One driver was given to each camel; but with each three camels one led the animals, the other two formed the escort. The camel corps was under the command of a superior officer; and in case of attack, instead of the baggage animals pressing in a confused mass on the troops for protection, they formed rings or squares, the animals kneeling down with their heads inwards, and from behind them the drivers drove off the assailants by the fire of their carbines.

This organization, by which Sir Charles obtained increased mobility for his army, was objected to on the score of expense, and was afterwards discontinued. The baggage corps providing its own escort had several important advantages; it maintained the effectives of each corps at their proper strength. No regular troops were fatigued by having to march in the dust at the slow pace of

the baggage animals. The drivers, not being all required to take the animals to graze, obtained rest alternately; being armed and led, did not desert on the first appearance of danger, and the General was relieved of any apprehension regarding the safety of his baggage train.

In Scinde, Sir C. Napier was operating in a country teeming with armed robbers and most daring freebooters.

In India, the Commissariat, as the only department accustomed to deal with contractors, is undoubtedly the proper department to entrust with the raising of the transport; it would be absurd to allow other departments to go to the open markets and bid for the transport animals they each require in opposition to one another. Whether it is the best department to look after it on service is very much to be doubted, for the one great reason that it has not sufficient officers to detail for the necessary superintendence of it.

A review of the Indian Transport arrangements, where the animals and followers are out of all proportion to the force sent into the field, would not answer our purpose, for we could not deduce any useful information for general purposes.

Sir J. Adye, in his remarks on transport in India, says: "The transport required for food, ammunition, medical stores, clothing, and the hundred details which go to meet the almost

artificial wants of modern armies, render rapid locomotion nearly impossible, and our Indian experience has hitherto been very adverse to light equipment.* For a century past, indeed, our troops have wandered slowly and wearily over the interminable plains, followed by long lines of elephants, camels, bullocks, and carts, transporting huge tents, together with tables, chairs, bedsteads, carpets, crockery, and many other unwieldy and unnecessary items of officers' and soldiers' equipment; and to these impedimenta must be added the hordes of native followers, who, far outnumbering the fighting men, have been and still are the invariable appendage of our Indian Army." The large amount of transport which accompanies our army in India is in part indispensable to carry the large and heavy tents so much required in that very hot country to maintain the European soldier in good health. Many animals are required to carry his kit, and by the employment of native servants he is saved many duties which, by exposing him to the

* In 1853-54, Colonel Mackeson, Commissioner of Peshawur, led an expedition to punish the Hasanzai tribes for the murder of Messrs. Carne and Tapp. The expedition was to operate in a difficult and mountainous country; but, speaking of the regular troops held in support, Lieutenant-Colonel Paget, in his record of expeditions, says: "They were in a confined, narrow valley, encumbered with impedimenta, double-poled tents, double sets of tents, doolies, palkies, and hundreds of camels; in short, the column was equipped as if for an ordinary march, and not for mountain warfare."

burning rays of an Indian sun, would soon undermine his constitution.

Too many servants make our soldiers in India lazy and helpless; a little more employment would be of advantage to their general health. After the arrival of the 11th Hussars in India in 1866, their Colonel discontinued the employment of syces (native grooms) to look after the horses; and the very healthy state of the regiment during nearly eleven years of service in that country was a positive proof that the extra work entailed on the troopers had not told in the least on their constitution.

According to the Indian regulations, carriage at the rate of 40 lbs. is provided for each non-commissioned officer and soldier proceeding on service, and ten per cent. of the private followers are allowed to accompany the troops. The sick carriage for European troops is calculated at five per cent. of the strength, and that for native soldiers at one per cent.

Afghanist

The first important military operation in which our army was engaged after the battle of Waterloo was undoubtedly the invasion of Afghanistan, and the subsequent operations under Generals Pollock and Nott. In these operations, the result, from the civil nature and want of organization of the transport, was anything but satisfactory. A paragraph in one of Sir W. Nott's letters describes the state of things on the first starting of the expedition:—

"The total strength, 10,000 fighting men, not including camel drivers, 40,000 camp followers, and 30,000 camels. The movements and establishments of the Persians under Xerxes and Darius Codomanus were here repeated upon at least the same scale."

Sir Charles Napier remarked of this expedition that "the convoys were like Falstaff's bill for sack, the troops like the item for bread."

Major Hough, in his account of the war, remarks: "The fact is, that most of the officers had too many camels, too large tents, and too much baggage; though Sir H. Fane had issued an order to caution all against taking large tents or establishments."

In 1839 the army marched from the Indus to Candahar without meeting any opposition on the way; still it suffered severe privations and an immense loss in stores and baggage animals. It is related that between Ferozepore and Candahar the loss of animals amounted to no less than 20,000. All through the operations in Afghanistan the large numbers of transport animals we had, most of which were ill-suited to the climate and too slow of movement, were a serious hindrance to our army. The principal causes which affected the health of the baggage camels were overloading, want of sufficient rest, insufficient grazing for the large quantity of animals employed, and, after a long march, too short a time

available for the animal, who is a slow eater, to graze sufficiently.

The following paragraph from Major Hough's account of the war explains partly to what was due the immense loss in baggage animals during this expedition:—

"We were obliged to carry our supplies, not getting a day's supply on the road. If we had entered the Pass (Bolan) with fresh cattle, or animals not jaded after a march of 833 miles from Ferozepore, 1038 from Kurnal—indeed, some of the cattle had marched nearly 1200 miles—the animals would not have been so knocked up; but they were worn out by a long march, bad water, and want of food, and therefore our loss was very severe, and those remaining had strength only equal to the carriage of half-loads. As the Rewaree camels (of which class they chiefly were) are not fed on grain, it will be readily imagined what numbers would die on a march where their food was to be derived from a barren country."

To all this should be added a certain amount of dishonesty on the part of the owners of the camels, who exaggerated the number carried off by plunderers to obtain compensation for more than they had actually lost, and to whose disobedience, in taking the camels to graze beyond limits and in forbidden directions, many of the losses were due.

The loss of Government stores and supplies was also very considerable. In one case Hough narrates how a convoy consisting of 2000 camels with 8000 maunds of grain, left Shikarpoor, and on arrival at Candahar it was found that little more than one-fifth of the grain only had reached that place.

In 1833 the Royal Wagon Train was disbanded, and in the British Army at home there was no *Crimea.* vestige of a Transport Corps left. When the war with Russia broke out, in 1854, and a British army was sent to Bulgaria, there was no transport for it. Horses and mules were purchased at Constantinople, Malta, Trieste, Barcelona, and in Turkey, and the Commissariat began organizing a transport. No provision either was made in England for the equipment of a Transport Corps at the commencement of the war; pack saddles, bridles, picketing materials, clothing, &c. had likewise to be purchased at Constantinople. On the expedition proceeding to the Crimea, sea transport not being available for the animals already collected, only seventy-five mules and a few Maltese carts were landed in that country with the army. A large convoy of Arabas, which luckily fell into the hands of the British soon after their landing, and the above, was all the land transport the British army had to rely upon until it established a base at Balaclava.

During the severe winter of 1854-55, when the

Commissariat arrangements for transport were found to have failed, a Land Transport Corps was raised by Royal Warrant of the 24th January, 1855.

This corps was a regularly organized body, principally officered by well-conducted non-commissioned officers from the regiments in the Crimea, and it was gradually augmented during the progress of the campaign.

At first our consuls abroad were appointed as agents for the purchase of the large amount of animals required, and they received a certain percentage, fixed by the Secretary of State for War, as a remuneration for themselves and for the payment of sub-agents and other expenses incurred previous to the delivery of the animals.

These consuls, possessing as they did a fair knowledge of the resources of the country, would have been very useful, were it not that it was found incompatible for them to absent themselves too much from their posts. Special agents, principally officers of the army, were therefore appointed for Syria, Bulgaria, Spain, and Piedmont, on fixed salaries, the salaries of sub-agents and other expenses being defrayed by Government.

With the special agents were accountants appointed by the Secretary of State for War, who, on their requisitions, paid for the purchases effected, checked accounts and pay lists, and

corresponded with the chief accountant, from whom they received instructions regarding the keeping of accounts and the money transactions of the agency. The agent arranged for the pay and subsistence of the convoys sent to the reserve depôts, and reported all transactions to the head of the Transport Department in the field.

Money was obtained by a warrant on the treasury chest signed by the commander of the forces, the head of the transport, and the chief accountant. On this warrant, the consuls, or special agents' accountants, negotiated a bill upon the treasury chest; or bills were drawn upon Her Majesty's Treasury direct where this was not feasible.

Animals were purchased at Diarbekir, Trebizond, Bagdad, Erzeroum, Samsoun, Bucharest, the Dardanelles, Antioch, Aleppo, Damascus, in Syria, Bulgaria, Spain, and Piedmont.

Two depôts were formed for transport animals; one in the Dardanelles, where all animals from Spain, Piedmont, Sicily, and the Archipelago were collected; the other at Sinope, for the reception of all animals purchased in Asia Minor.

By the beginning of 1856, 28,000 horses, mules, and camels had been obtained for the prosecution of the war in the spring.

The Director of the Transport reported that it was found that the most efficient agents for purchase and hire of transport were officers of the

army. Some of these were Colonel Moberly, Royal Artillery, and Colonel Kinloch, in Spain; Captain MacDougal, Royal Artillery, in Piedmont; Captain Jones and Dr. Hyslop at Bagdad.

The Land Transport Corps worked entirely in the Crimea, but at Scutari and other places in Turkey where we had troops the Commissariat continued to have charge of the transport.

The Land Transport Corps, notwithstanding the hurried way in which it was organized and the extremely raw material of which it was composed, worked exceedingly well; the fact, however, remains that its efficiency and working were not thoroughly tested, as the British Army in the Crimea was stationary, and the duties of the corps consisted in bringing up stores, supplies, and war *matériel* from Balaclava to the various divisions and depôts at the front.

At the conclusion of the war the strength of the corps was much reduced, and it was turned into the Military Train. Since then a portion of this corps has been engaged during the Indian Mutiny (where it acted as Light Cavalry), in China, New Zealand, and Canada. On the formation of the Control Department it lost much of its military character, and was turned into the transport companies of the Army Service Corps.

Passing over the Persian War and Indian Mutiny, where the transport was organized,

according to the Indian scale of requirements, we come next to the war in the north of China of 1860.

China. The Land Transport for the force sent to China had to be entirely formed; it was placed under the control of the Commissariat, and officers were despatched to India, Singapore, Japan, Manilla, and the Chinese treaty ports to make the necessary purchases of animals.

A horse and bullock establishment, composed of about 2500 animals and 2000 drivers, was organized. It was divided into three brigades, officered and superintended by the Battalion of Military Train sent with the expeditionary force. The drivers came from India, China, and Manilla, each man having the care of three animals. A number of wagons and Maltese carts were supplied from Woolwich, but were found to be of inferior quality.

Besides the above establishment, a corps of Chinese carriers, about 3000 in strength, was raised, divided into companies, commanded by Officers of the Line and Indian Regiments, and superintended by non-commissioned officers and native headmen, these last also acting as interpreters.

The Chinese Coolie Corps was raised at Canton by Major Temple, for the transport of the munitions and stores of the army. The men received as pay nine dollars (or £1 17*s.* 6*d.*) a month, and

were supplied with rations and two suits of clothes. The coolies were dressed in Chinese jackets and loose trousers, while their feet were left bare. On the jacket, both before and behind, within a black circular line, was inscribed the number of the individual, and below it that of his company, separated by a black line. They wore bamboo caps with the letters C. C. C. (Canton Coolie Corps) painted in front.

The scum only of the population of Canton enlisted, as a rumour had spread about that the men were to be thrust forward to receive the brunt of battle, whilst the British, sheltered behind them, would fire away without danger to themselves.

The fearless conduct of the Coolie Corps at the attack of the Takoo Forts excited the admiration of the troops; but, being composed of thieves, pirates, and the lowest of the population, they could with difficulty be kept from plundering and committing mischief. The coolies used to slip away from camp and prowl about the neighbouring villages in search of plunder, and otherwise misconducted themselves, until at Tung-chow the General had one of them hanged as a warning to the rest.

Large quantities of stores were also conveyed by a river to a point fourteen miles only from Pekin.

No animals were to be obtained at Singapore;

two or three thousand horses were, however, purchased in Japan, but very few were taken out of the country, for want of sea transport. The war came suddenly to an end, and a large number, which cost Government twenty-five dollars apiece, had eventually to be resold for five dollars each.

The plan of employing the men of the Military Train, each to look after ten drivers and thirty animals, was found in practice not to have worked well. The private soldier does not possess the tact so much required when working with natives, and a superior stamp of man than what is generally found in the ranks is required to assume suddenly the charge of a number of men and animals.

New Zealand.

The China War had no sooner been brought to a successful termination than hostilities broke out in our colony of New Zealand, and a Transport Corps had to be provided to enable the troops to commence operations against the Maoris.

At the breaking out of this war, which lasted from 1861 to 1865, there was no organized Land Transport in the country, and Deputy Commissary General Bailey, the same officer who had the direction of the Land Transport in the campaign in the north of China, was called upon to organize one. Government was fortunate in securing on this occasion the services of an officer, who had in a very recent campaign

obtained great experience in this branch of the service. To find the same officer at the head of the transport in two following campaigns is a thing which, owing to our extended colonial possessions, does not often occur.

It is needless to say that under such an officer, in whose mind the shortcomings and defects noticed in the former campaign were still fresh, the organization and working of the transport could not fail to become vastly improved, and the corps greatly increased in efficiency.

The formation of a Transport Corps was approved in June, 1861, and it was called the Commissariat Transport Corps. At first it was arranged to raise two companies, each of the following strength, viz., one Officer, one Staff Serjeant, five Serjeants, and 100 privates as drivers, each private to look after two animals. The men were raised from the British Troops and Colonial Militia, and received extra pay at the following rates:—Officers, 9*s.* 6*d.* per diem; Serjeants, 2*s.* 6*d.*; Privates, 1*s.*

Other companies were formed as reinforcements arrived, until, towards the close of the war, the strength of the Transport Corps amounted to 41 Officers, 125 Non-commissioned Officers, and 1341 men, with 1516 horses and 728 bullocks. A Battalion of the Military Train arrived in the country towards the end of the war, but the transport continued to remain

in charge of the Commissariat. It was not likely that after three years' experience had imparted to the transport a certain degree of efficiency, it would have been transferred to the direction of an officer who had just arrived in the country. The Lieutenant-General Commanding in New Zealand, in stating his reasons for keeping the Military Train and Commissariat Transport distinct, says: "I believe that if the two corps were amalgamated, contrary to the expressed opinion of the Deputy Commissary General, any failure or irregularity in the supply of the troops in advanced positions might possibly be attributed to the want of direct control over the transport."

To obtain the necessary transport animals for the first two companies, 100 pack horses were ordered from Sydney, 50 horses for pack (at the maximum price of £20) and 25 for ambulances were purchased in Auckland, where 30 double-draught animals and 450 pack saddles were also contracted for.

Bullocks were purchased on the spot, in Taranaki and Auckland, the purchase of horses and bullocks in the latter place being entrusted to a board of officers.

Owing to pleuro-pneumonia prevailing in the country, bullocks perished in large numbers during the campaign.

A large portion of the transport in this war

was performed by water; on one route alone the supplies had to change mode of conveyance eight times in a length of 111 miles. The depth of water up the rivers being very small, rowing boats to carry ten to twelve tons, and drawing two feet of water, had to be built; two companies of boatmen were raised for this service.

A pack saddle from the Cape was first used in the transport, but it was not found to answer, as it gave a number of horses sore backs; the Otago saddle was substituted for it with good effect. The carts of the country were also found superior to those supplied by the Military Store Department.

Looshai Gold Coa Duffla

The expeditions to Looshai and Duffla in India, and the war on the Gold Coast of 1873-74, afford good examples of transport done principally or entirely by carriers. In the two first, the country in which the troops moved was hilly, whilst it was quite flat in the third, with the exception of the Adansee Hills. The roads, however, in all three led through dense forests, and in the latter, from Cape Coast Castle to Coomassie, a distance of about 180 miles, there was hardly a clear space even of a few acres to be found.

In Looshai, the success of the expedition was risked by the Indian Government directing a large portion of the transport to be given over to the control and management of the Com-

missariat. As previously remarked, the officers of the Indian Commissariat attend to both the supply and transport branches. The Quarter Master General, in a letter to the Secretary to the Government of India, Military Department, with regard to this organization, in this instance remarked: "The Commander-in-Chief considers that the ordinary Commissariat superintendence is not sufficient to provide for the economical use and employment of the carriage, whether it consists of coolies or elephants, and that this carriage should be regularly organized with a sufficient staff of officers and subordinates."

General Bourchier, commanding one of the columns, in a report to the Quarter Master General, says: "I have acted directly in obedience to the orders of Government in making over the whole of the Commissariat coolies (about 1400) to Colonel * * * † I have done so under the positive orders conveyed to me, but utterly contrary to my own convictions. Instead of acting in an administrative capacity, Colonel * * *'s time is taken up in running about from station to station, trying to find out where the coolies are. On arrival in camp, there is no one to look after them; and from the Commissariat Officers being employed on duties alien to their legitimate position, I never can find out what Commissariat stores are to the

† One of the Commissariat Officers with the Cachar column.

front, or how many days' supply I may depend on, or how far I can with safety move.

"In fact I am, as far as military movements are concerned, at the mercy of the Commissariat, who have, with the exception of the Coolie Corps, complete command over the carriage, which they use as they, not I, think best, and regarding whose whereabouts or efficiency I cannot get a report out of Colonel * * *, although he has frequently been called upon for the information I require."

In the other column the Commissariat Officer expressed his wish to the General Commanding not to be put in charge of the coolies; the Commissariat Department, being already overworked, could not be expected to undertake the management of 1400 coolies over such a long line of operations.

In the Duffla expedition the Coolie Corps was kept intact as one body, with its own organization, under command of a Colonel in the army, to provide transport for all the wants of the force, and this organization was found to answer well.

On the Gold Coast a Supply Officer of the Control Department was first put in charge of raising and directing the transport; but later on its direction was transferred to the officer in charge of the line of communication, with an adequate staff of officers to assist him.

Lord Napier proposed the following organization for the Coolie Corps for Looshai, viz. :—

1 European Officer,
1 Assistant,
4 1st Class Subordinates,
20 Mates,
300 Men.

In the Duffla Expedition the corps consisted of four divisions, under a Commandant. Each division was as follows:—

1 European Officer,
3 Non-Commissioned Officers,
12 Sirdars, or Mates,
300 Men.

Each division was divided into three companies of 100 men, under a smart non-commissioned officer, with a sirdar, or mate, for each of its four sections.

On the Gold Coast there was no particular organization, and the strength of an officer's charge varied very much.

From *A Narrative of the Expedition to Looshai*, by Lieut.-Colonel (now Major-General) Roberts, V.C., we obtain the following information regarding the organization of the Coolie Corps:—

"The monthly pay of the carriers was fixed at eight rupees for carriers, ten for mates, twelve for sirdars (headmen).

"None were entertained under twenty or over forty years of age, and the men came from the Punjab, Lucknow, Cawnpore, Allahabad, Chota, Nagpore, and the neighbourhood of Darjeeling.

On enlistment the men received an advance of one month's pay; they were engaged for a period not exceeding eight months, and were allowed to make family remittances. In case of death, the man's family was to be allowed a gratuity of three months' pay.

The load carried was not to exceed twenty seers (40 lbs.) in addition to the man's own kit. Each man was supplied with—

1 blanket,
1 blanket jacket or loose coat,
1 pair of shoes,
1 pair of socks,
1 pair leg bandages, cloth,
1 havresack,
12 feet of good stout cord,
1 dhao or kokery,
1 waterproof sheet between every two men.

The last two articles were to be returned into store.

The weight of the man's kit was very heavy, viz.:—

	lbs.	oz.
Blanket	7	0
Waterproof sheet	4	8
Cooking pots	4	0
Dhao	1	12
Havresack with a day's ration, &c.	4	12
	22	0

The total weight carried was therefore 62 lbs., and this is a very severe load for a man to carry day after day in a hilly country. However, to keep the men in health, none of the above articles could be omitted.

For every 600 men there were—

1 Native Doctor,
1 Goomashta,
2 Moonshees,
6 Headmen,
24 Mates,
6 Havildars, Naiks, or intelligent Sepoys.

The men received free rations on the scale allowed for followers.

The weight carried by transport men in Looshai and Duffla was about 40 lbs.; but in China and the Gold Coast 50 lbs. was the regulation weight, though many of the loads never came up to that weight. In the latter country one carrier was allowed to each Regimental Officer, and one for the kit of three soldiers. The small 7-pounder guns were dismounted; the piece, slung on a stout bamboo cane, was carried by four men, a carrier being allotted to each wheel, and three to the gun carriage. The ammunition was packed in small cases, each case a load for one carrier. With rockets, one carrier conveyed the tube, and others each a bundle of six rockets. The men of the 2nd W. I. Regiment, native levies, and the Kroomen from the men-of-war,

were employed for a long time in duties of fatigue connected with the carriage of provisions and ammunition to the front.

Abyssini The Abyssinian Expedition ranks with the Crimean War in the magnitude of its transport arrangements. The army had to march 380 miles to Magdala, over a country totally destitute of provisions, on roads very trying both to man and beast. Most ample details of everything connected with this expedition are to be found in the account of it written by Major Holland and Captain Hozier, and from which the following particulars principally are taken.

Instructions were forwarded by telegraph from England, as early as the 31st July, directing the collection of animals for the expedition to be set on foot in Bombay.

It being deemed impossible to obtain in India the large number of transport animals required, steps were taken by the Secretary of State for India for purchasing mules in Spain, Italy, and Turkey.

Colonel Clarke-Kennedy, of the Military Train, was appointed to direct the arrangements for obtaining mules north of the Isthmus of Suez, and the following officers were sent to effect the necessary purchases:—

Destination.	Military Officer.	Commissariat Officer.	Veterinary Surgeon.
Alicante	Capt. Whinyates, R.A.	Assistant Commissary General Cumming.	Mr. Partridge.
Valencia	Capt. Wortham, R.A.	Assistant Commissary General Irving.	,, Bolton.
Barcelona	Lieut. Turnbull, R.A.	Deputy Commissary General Wingfield.	,, Harrison.
Majorca and Minorca.	Capt. Corbett, Mil. Train.	.....	,, Death.
Piedmont and Genoa.	Lieut. Roberts, Mil. Train.	Assistant Commissary General Baynes.	,, Harpley.
Smyrna	Capt. Hobart, R.A.	Assistant Commissary General Downes.	,, Henge.
Scanderoon ..	Lieut. Brace, Mil. Train.	Assistant Commissary General Maule.	,, Tatam.
Antioch and Aleppo.	Major Dartnell ..	Ditto	,, Marshall.
Tyre, Sidon and Beyrout.	Capt. McNeill ..	Deputy Assistant Commissary General Casolani.	,, Fleming.
Samsoun and Trebizond.	Capt. Webber, R.E.	Deputy Assistant Commissary General Furse.	,, Anderson.
Gibraltar.....	.....	.....	,, Field.
Spain, under Mr. Wetherell's contract.	.....	.....	,, Thacker.

These officers received above the pay of their rank £3 3*s*. per diem, to cover all extra expenses. Those ordered to Italy and Spain received an imprest of £50, those to the Levant of £100.

The General Officers commanding at Malta

and Gibraltar were requested to have mules purchased in the vicinity of their commands, and consuls and other people were authorized, by the Special Service Officers, to purchase for the Indian Government, receiving a five per cent. commission.

Colonel Clarke-Kennedy established his headquarters at Alexandria, and formed a depôt there and a second one at Suez. His arrangements did not go further than Suez ; steamers chartered by the Bombay Government were sent there to embark the mules and convey them to Abyssinia. To assist him in his duties were attached to him 8 Officers and 26 Non-commissioned Officers of the Military Train, two Commissariat Officers, and a Veterinary Surgeon. With the Commissariat Officers rested all the arrangements for foraging and maintaining the muleteers and mules at the two depôts in Egypt.

The Admiralty chartered seven steamers for the conveyance of the mules to Egypt. Each steamer was furnished with head-stalls, compressed forage, and a steam hoist for embarkation, and had a Veterinary Surgeon on board, who took charge of the animals on the passage and handed them over to the officer commanding the depôt at Alexandria.

Mules were to be inspected and passed by the Veterinary Surgeons, and none bought under four years of age, and each animal was to be

branded on one hoof and on a flank at soon as possible after purchase. Attendants at the rate of one man per eight mules were to be engaged, to remain in Egypt for one month, being provided after that with a free passage home. Headmen were put in charge of twenty men, their pay being fixed at three shillings per diem, besides rations or compensation in lieu thereof. Each muleteer received 1*s.* 6*d.* per diem, free rations on board ship, and ninepence in lieu thereof on service.

A printed card, signed by Colonel Clarke-Kennedy, was given to each man on his engagement: this had blank spaces for future entries, to be filled in by the officer who engaged him, and who signed across his card his promotion or reduction. A numerical roll of these cards was kept; all payments were entered on the same, specifying the date of such. Each man wore a numerical metal badge, the headmen also wore one, but of a different metal.

By the 6th November, 1867—otherwise in about a little over two months—Colonel Clarke-Kennedy reported his purchase of 8000 mules to have been completed.

The order in which the following places are given shows the relative adaptation to the service of the pack animals purchased at each:—Cyprus, Brindisi, Malta, Cairo, Smyrna, Gibraltar, Alicante, Valencia, Scanderoon, Beyrout.

As for prices, Colonel Clarke-Kennedy thought he would be able to obtain about 2000 mules in Syria, delivered at Cairo for £25 each; but he purchased 250, and these were delivered at Suez for £26 10*s.* per animal. The railway fare for mules from Alexandria to Suez was thirty-three shillings per mule, including attendants.

The principal purchases appear to have been made in the following order:—Gibraltar, Smyrna, Beyrout, Valencia, Alicante, Cyprus, Scanderoon, Malta, Italy.

The total number of animals received by the Abyssinian Transport Train from Suez amounted to 10,045 mules, 1302 donkeys, and 741 camels.

The efforts for purchasing animals for a sufficient Transport Train were not confined to the north of the Isthmus of Suez, for agents were also sent to effect purchases in the Persian Gulf and in Arabia, and an order for the purchase of mules in the Punjab was issued.

From Bagdad and Bushire 1588 mules and 334 ponies were sent to Abyssinia. Most of the animals were conveyed to Bombay in native boats, the average price of each mule being Rupees 124–8, *plus* Rs. 50 for each animal delivered alive in Bombay.

In the Punjab, mules and yaboos (strong load-carrying ponies) were ordered to be purchased for the expedition at Rupees 225 and 150 each

respectively,* and two depôts were formed, one at Rawul Pindee, the other at Lahore. The total number of animals supplied by the Punjab amounted to 2641.

See Appendix E.

It is worth remarking that in Abyssinia the drivers from the Punjab were found to be the best of the whole employed during the expedition, and the Muzbee Sikhs the strongest and most enduring men; in the Duffla Expedition the Muzbee Sikhs and the Punjabee Cahars were the best amongst the carriers.

Forty-four elephants were shipped at Bombay for Abyssinia. The animals proved a great acquisition to the Force, and were mostly used in conveying artillery.

Sir Robert Napier wished to organize a Land Transport Corps under the Quarter Master General, removed from the control of the Commissariat, as he considered that the ordinary Commissariat superintendence was not exactly what was required for the efficient working of a corps of such large proportions. He proposed Major Warden, an officer who had served with the Land Transport in the Crimea, as Director, and caused him to prepare what he considered was a desirable organization for a Transport Corps.

The proposed organization, when submitted to the Bombay Government, did not meet with the

* The maximum price paid for animals for the expedition to Bhootan was—Mules, Rs. 180; Yaboos, Rs. 120.

approval of His Excellency the Governor, who, basing his arguments on the Report of the Committee on the Administration of the Transport and Supply Departments of the Army of 1867, disapproved of the Transport being placed under other authority but that of the Commissary General, and found the organization proposed by Major Warden too elaborate and complicated; he also objected to the subdivision of the whole transport into divisions.

Sir Robert Napier was obliged to abide by the decision of Government, but insisted on a complete organization, particularly on the score of the mixture of races amongst the drivers. The Government, however, considered one officer capable of looking after 1000 animals, and the whole transport, divided into troops of 100 mules, each under a native officer, to be sufficient.

On the 12th September, 1867, a Government Resolution placed the Land Transport Corps, on arrival in Abyssinia, under a Controller of Supply and Transport, and sanctioned the organization proposed by the Commissary General of the Bombay Army.

20,000 mules or pack bullocks and 8000 camels were deemed necessary for the force, and 14 Captains and 28 Subalterns were detailed for duty with the transport. Volunteers were called for from the non-commissioned officers and men

of both European and native Regiments to fill the posts of superintendents.

The following men and animals were collected in different stations of the Bombay Presidency :—

Poona—
1000 ponies,
4000 pack bullocks,
1800 muleteers,
1600 camel drivers,
560 dhooly bearers.

Kurrachee—
200 dhooly bearers.

Deesa—
100 camel drivers,
30 muleteers,
200 dhooly bearers.

Belgaum—
50 muleteers,
100 dhooly bearers.

Bombay—
300 camel men,
200 muleteers.

In Abyssinia were bought 3130 mules.

In the month of January the state of the transport at Zula was anything but encouraging. Mules were landed without even a rope to picket them with, and, there being no one to take charge of them and being consigned to no one in particular, they were cast loose on shore, where they roamed about in search of forage and water,

and many died. At last parties of soldiers were sent to hunt them up, and by the help of long ropes captured a good many and took them to the depôts.

Many of the animals on landing, particularly camels, were found unfit for work. The muleteers from Egypt misconducted themselves, many deserted, and the rest were sent back. These men had been promised warm clothing, boots, and other articles of kit, which could not be provided; they had no cooking utensils, and interpreters to understand their complaints were wanting; they became insubordinate, and were flogged and sent away.

The causes of all this confusion and disorder were, that insufficient officers and men were at first sent out to receive and take charge of the animals on landing; the want of a head at the port of debarkation; want of experience in working a Mule Train, both in officers and men; the exaggerated reports of the supply of forage and water procurable at the place of landing; lastly, that animals, drivers, and equipment were put on board of separate ships.

In the middle of the month of February the Train was divided into two sections: the Highland Train, composed of the Rawul Pindee and Lahore Mule Trains, with A and D Divisions of the Bombay Train, was to work over three hundred and seventeen miles of road, from

Senafé to Magdala; the Lowland, composed of three divisions of mules, three of pack bullocks, three of camels, and one of carts, was to bring provisions, &c., from Zula to Senafé.

The Highland Train worked well; but, notwithstanding the several reductions of camp equipment, baggage, &c., on the way up, had not the inhabitants of the country come forward to carry loads, it is doubtful whether the troops would have reached Magdala. On the return of the force a good part of the road had been improved and made available for carts.

Transport Train sick animal depôts were formed seventy-five miles from each other, with officers, charged with receiving mules and other animals, of which a great number fell sick owing to insufficient and bad fodder and hard work.

The above is only a very brief account of the steps taken for providing our armies with means of transport in some of our former wars; it would materially help in future cases if we could ascertain, however approximately, the total amount of transport that would be required for a given force.

Appendix F. The tables showing the regulation strength and composition of one of our Divisions and Army Corps,* show what is deemed necessary

* Issued with Army Circulars of August, 1875.

for the conveyance of baggage and camp equipage, intrenching tools, reserve ammunition, field hospitals, sick and wounded, bakery and butchery trains—what, in fact, may be taken as the known quantity; but no mention whatever is made of the transport required for the provision columns or Commissariat supplies, which always varies according to circumstances.

The strength of an Army Corps is given at 36,805 of all ranks, with 8722 horses, 1513 transport carriages, and 3141 transport horses.

Taking the soldier's ration, exclusive of meat, at 2 lbs. per diem, the total amount to be carried for three days' provisions, which would generally accompany an Army Corps, would come to 220,830 lbs., requiring 100 wagons* and 400 horses; and the forage for 11,863 horses, at 24 lbs. each, to 854,136 lbs., demanding 386 wagons with 1544 horses more. The same amount for three more days' subsistence to follow the Army Corps, would give a total of 972 carriages and 3888 horses for provisions and forage.

Taking it for granted that the Cavalry, Artil-

* Weight of general service wagon, 16¼ cwt. ... 1820 lbs.
Weight of load ..... 2212 lbs.

4032 lbs.

Weight for each horse, 9 cwt.

The weight of load for country wagons drawn by four mules or bullocks would be 1600 lbs.

lery, Engineer Train, &c., are complete in horses, there will still remain 7029 horses required, and 2485 carriages of various sorts for an Army Corps, complete with six days of rations and forage.

The strength given for a Division, 10,156 of all ranks, approaches more to the strength of the expeditionary forces we have employed in such countries as China, New Zealand, and Abyssinia; for this, 583 carriages of various sorts and 1670 horses will be required. To these totals must be added a certain percentage of spare animals, which will generally amount to from 10 to 20 per cent. of the above numbers.

The calculation for food and forage has only been made for the actual number of all ranks in the detailed table of Army Corps and Divisions; no account has been taken of food and forage required for men and horses of the provision columns. The 3888 horses and 1944 drivers, for those of an Army Corps, will require for six days 23,328 lbs. of rations and 559,872 lbs. of forage; additional carriage has therefore to be provided for a total of 583,200 lbs., equal to 264 wagons and 1056 horses. For a Division, 844 horses, and 422 drivers, require 5064 lbs. of rations, and 121,536 lbs. of forage; or conveyance is required for 126,600 lbs., demanding 58 more wagons and 232 horses.

Straw or hay for the horses and other animals

will seldom be carried, as they would greatly augment the transport of an army. These articles must be obtained in the country itself, either by requisition or by parties going out to cut the standing crops. However, in some cases (as happened in the Afghan War, where no forage was to be had, and numbers of horses perished or became unfit for work owing to the scarcity of grain and forage) we have to employ cavalry and transport animals in countries entirely wanting in forage, and it must be conveyed for them.

Deputy Assistant Commissary General Bailey, at the close of his report on the transport in the campaign in the north of China, gives the following estimate of what he considers the lowest amount of transport required for a force of about 9000 strong:—

Estimate—Carriage for
Regiment of Infantry, say 800 *strong.*

	lbs.
80 tents, with waterproof sheets, billhooks, and camp kettles for men, at 100 lbs. each	8000
800 blankets, at 3½ lbs. each	2800
112,000 rounds of small arm ammunition, being 140 per man, at 120 lbs. per 1000 rounds	13,440
12 officers' tents, at 100 lbs. each	1200
Carried forward	25,440

Brought forward....lbs.	25,440
35 officers' baggage, at 100 lbs. each	3500
Ambulances for carriage of sick, at 5 per cent. of the force, 40 men, equal to 200 lbs. each	8000
Medical panniers and hospital comforts, say	1200
	38,140

Equal to 32 wagons, at 1200 lbs. each.

Regiment of Cavalry, say 400 *men and* 400 *horses.*

	lbs.
50 tents, with waterproof sheets, &c., for men, at 100 lbs. each	5000
800 blankets (one per man, one per horse), at 3½ lbs. each	2800
60 rounds of spare ammunition per man, 24,000 rounds, at 120 lbs. per 1000 rounds	2880
20 officers' baggage, at 100 lbs. each	2000
10 officers' tents, at 100 lbs. each	1000
Picket posts and ropes for horses, say	3000
	16,680

Equal to 14 wagons, at 1200 lbs. each.

A Battery of Artillery, say 200 *men and* 160 *horses.*

	lbs.
25 tents, with waterproof sheets, &c., for men, at 100 lbs. each	2500
200 blankets for men at 3½ lbs.	700
5 officers' tents, at 100 lbs. each	500
8 officers' baggage, at 100 lbs. each	800
Picket ropes and pins for horses	1125
600 rounds of field ammunition, at 14 lbs.	8400
	14,025

Equal to 12 wagons, at 1202 lbs. each.

Royal Engineers, say 400 *strong.*

	lbs.
The rate of half a Regiment of Infantry.....	19,070

Equal to 16 wagons, at 1200 lbs. each.

Royal Engineer Park (ordinary).

	lbs.
For Field Service.....	14,400

Equal to 12 wagons, at 1200 lbs. each.

General and Brigade Staff.

Baggage and tents of, say	14,400

Equal to 12 wagons, at 1200 lbs. each.

Thus—

	Officers and Men.	Chargers.	Wagons.
8 Regiments of Infantry (32 wagons per Regiment)	6400	100	256
3 Regiments of Cavalry (14 wagons per Regiment)	1200	1200	42
4 Batteries of Artillery (12 wagons per Battery)	800	640	48
Royal Engineers	400	30	16
Royal Engineer Park	..	..	12
General and Brigade Staff	25	50	12
Commissariat Staff for 5 Brigades, including baking, butchering, and mining implements	70	10	25
Total....	8895	2030	411
Commissariat Supplies.			
Three days' provisions to accompany the Force—		lbs.	
27,000 rations provisions, at 3lbs.		81,000	
6,090 rations forage, at 22 lbs.		133,980	
Three days' provisions and forage to follow the Force—			
Provisions		81,000	
Forage		133,980	
		429,960	360
			771
To this must be added 25 per cent. for casualties, as this branch will certainly sustain, from sickness, breakage, and other causes, more loss than any other part of the Force.			193
Total Wagons.....			964

To work the 964 wagons it will take—

	Number of Horses.	Number of Men.	Wagons.
4 Horses to each wagon	3856		
1 Man to a pair of horses	..	1928	
6 Non-Commissioned Officers to 20 wagons		289	
1 Riding horse to each Non-Commissioned Officer	289		
1 Commissioned Officer to 20 wagons (mounted)	48	48	
A Senior Officer and Staff, to control say 9 Officers, 18 Clerks; Officers mounted, each 2 horses	18	27	
Veterinary Surgeons, mounted	8	8	
Shoeing Smiths, 2 to 20 wagons, with 1 forge complete, drawn by 2 horses, and medicine chest attached	96	96	48
1 Carpenter and harness-maker to 20 wagons, with cart drawn by 2 horses for tools	96	96	48
Total strength of Transport ..	4411	2492	1060

Deputy Assistant Commissary General Bailey provides in his estimate sick carriage for only 340 men, which is not 5 per cent. of the whole force; whereas it is generally considered necessary to make provision for 10 per cent. of sick.

In his report on the French Military Transport in the campaign in the Crimea, Lord Strathnairn gives the strength of the French Army as having reached the number of 150,000 men; the number of transport animals is given by him at 14,000, or about one animal for ten men. The French Army here was stationary,

the only detachments away from Sebastopol being one at Eupatoria, another, of 12,000 men and 1700 horses, in the valley of Baidar. General Macdougall, in his *Theory of War*, says: "The estimated number of animals required to enable our army in the Crimea of 30,000 men to take the field with efficiency was upwards of 20,000."

In the campaign in the north of China, for a force, all told, including followers, of 22,000, with 6000 animals, the transport consisted of—

Horse and Bullock transport	2500
Coolies 2500 (or at the rate of four coolies to one animal)	625
	3125

or one animal for each seven men.

In the New Zealand War the strength of the transport varied with that of the force engaged; a return on the 1st May, 1864, shows 15,017 men, with 2244 transport animals, or nearly one animal for seven men. It should be noticed, however, that the forces in New Zealand had hardly any Cavalry, the little there was, about 500 men, being furnished by the Colonial Defence Force; further, that in both the China and New Zealand Wars there was plenty of water transport besides the land one, so these figures would mislead if taken to embrace the whole of the transport available in these two campaigns.

In Abyssinia, according to the Assistant Quar-

ter Master General's return on the 1st April, the month in which Magdala fell, we find a force of 12,601 men and 14,500 followers, in all 27,101 men. At the date of the capture of Magdala the number of transport animals amounted to 28,835, of which 3565 were sick.

The return of animals received in the Transport Train from the beginning to the end of this campaign shows that 41,723 animals were received from all sources. The difficult state of the roads, and the insufficiency and bad quality of the fodder, obliged a large reduction of the loads to be often resorted to.

Deputy Assistant Commissary General Bailey estimates that carriage will be required for each man of the force at the rate of 55½ lbs., more 3 lbs. per diem for rations, and 22 lbs. per diem per horse for forage. He makes no allowance for the camp followers, who in many of our expeditions have to be subsisted just the same as the fighting men.

In proportion to the length of the objective from the base, the unhealthiness of the climate and the poorness of the country, as was exemplified so well in the case of the Abyssinian Expedition, so will the number of our transport animals increase until it equals, if it does not surpass, the number of the troops engaged.

The difference in the strength of the transport employed in former wars will show how next to

impossible it is, with our varied wars and expeditions, to lay down, with any degree of approximation even, the amount of transport that will be required for a certain numerical force entering on a campaign; this arises from the special organization which seems to be adopted every time our armies take the field.

Were we to conform, however, in every war to certain details of organization—for example, those issued with the Army Circulars of 1875—and depart from them as little as possible, or were other details for a smaller force, say of the strength of one Division, adopted for use in distant and difficult countries, then the strength of the transport required would cease, but in very exceptional cases, to be a difficult quantity to estimate. Then the experience of succeeding wars in this important department of the army would come useful, as the organization in each successive case would undoubtedly adopt the improvements found necessary on service, and the efficiency of the transport would not fail thereby to be found greatly increased.

VARIOUS DESCRIPTIONS OF TRANSPORT.

Stores, supplies, *matériel*, &c., can be conveyed—

1*st*. By railway.

2*nd*. By wheel carriage or pack animals on ordinary routes.

3*rd*. By carriers.

4*th*. By vessels on lakes, rivers, or canals.

5*th*. By sea in steam vessels or sailing ships.

There are various descriptions of Land Transport suitable for an army; of these, the most susceptible of order, and most suitable to the country in which operations are to be carried out, should be chosen in preference to all others to accompany the troops; the other kinds will always be useful for working on the line of communication in rear.

Carriers.

In several of our wars and expeditions, but principally in those in China, Abyssinia, Looshai, Ashantee, and Duffla, carriers have been largely, if not entirely, used as Military Transport.

Not only in India, but in many other countries, the entire carriage of the sick and wounded has been performed by carriers.* *See Appendix.*

* For the conveyance of the sick and wounded by carriers, dhoolies, hammocks, cots, and dhandies are used. The com-

Carriers have different ways of carrying loads; some carry entirely on the head, a general custom in most parts of Africa; some carry on the back, as with the hill coolies in India; with others a load is divided between two or more men, who carry it pending from a pole or bamboo. In some parts of India and in China coolies carry heavy loads suspended from the two ends of an elastic piece of bamboo.

As a general rule, in hilly countries men will

mon Indian Army dhoolie weighs 120 lbs.; admirable for the plains, it is ill adapted for hilly countries, and difficult to pack on board ship. The hammock is either a common ship hammock, as used on the Gold Coast, or one of MacGuire's field hammocks, as used in Abyssinia, lashed to a pole or bamboo. MacGuire's is the lightest, and weighs with pole about 24 lbs. Hammocks get baggy in the centre, and the patient is made uncomfortable by the body being bent, and its weight being thereby unfairly distributed. A swinging cot has most of the advantages of the dhoolie and the lightness of the hammock; it weighs about 54 lbs., packs easily, and is good for bad roads and hilly country. Both the hammock and the swinging cot have no legs like the dhoolie, and cannot be laid on wet ground. In Ashantee, where wood was plentiful, tripod stands were made at the resting-places, and the poles of hammocks and cots were rested on these; there the above disadvantage, except when a rest was required on the line of march, disappeared. The dhandie is more suitable than the dhoolie for hilly country; it weighs from 46 to 54 lbs., but generally has no cover to protect the occupant from the sun or rain. Surgeon-Major Isidore Bourke showed a very ingenious dhoolie at the Imperial Durbar Camp at Delhi in 1877. It was light, easily packed, easily repaired, cheap, and lasting; besides other advantages, it could be used as a stretcher, as a mule or camel litter, as an hospital cot, as a swing cot in a railway wagon, on board ship, and in an ambulance cart.

be found to carry their burdens on the back, and in flat countries on the head. How the loads are carried is immaterial; if the men are permitted to choose their own way, they will adopt the one they are accustomed to, and will thus do their task much more easily.

In the China and Ashantee Wars the weight of a load for each carrier was 50 lbs., but it seldom came fully up to that. Some use was made of women carriage in the last place, and these hard-working creatures carried the same weight as the men, with the addition generally of a child on the back, and did their work very cheerfully.

In the Looshai and Duffla Expeditions the weight of a load was 40 lbs. The steep and slippery state of the roads ought always to be taken into account in fixing the amount of weight each man has to carry.

Stores require to be made up as much as possible in uniform weights, which will materially help in loading. Packages of particular shapes are better balanced and more easily carried than others. On the Gold Coast, tea, flour, rice, and preserved provisions were carried in boxes, salt meat in conical tubs, and biscuits* in bags. The

* In countries liable to a sudden downpour of rain, biscuit is liable to get damaged if carried in bags. Where loads, besides, are continually taken up and put down, the biscuit is much broken and reduced to dust, and the weight of each bag soon gets lessened; the bag gets torn and broken, and the carriers, as was often the case on the Gold Coast, help themselves freely.

carriers preferred the conical tubs to any other load.

Carriers have the disadvantage of occupying a great space on the line of march and of requiring strong escorts. The mates and other superintendents, not carrying loads, should always be armed, and should form part of the escort. Carriers have their own kit to carry in addition to their loads; and in some countries blankets, waterproof sheets, spare clothing, &c., are indispensable to keep the men in health. This last disadvantage will disappear when staging operations can be introduced—a system which will be found always to answer best both with men and animals.

Corps of carriers will come in very useful at the port of debarkation, and at the principal depôts on the line of communication, for unloading stores from board ship, loading wagons, trains, clearing wharfs, &c.; a properly organized body would greatly facilitate and quicken the work at such places.

Pack Animals.

Pack animals are generally used in hilly countries, where bad and difficult roads abound. In determining the weight to be carried by pack animals, the minimum weight should be considered in preference to the maximum. The weight carried by pack animals is a dead weight, and on long marches, with long periods of waiting, very

trying and fatiguing to the animals.* Among a large number of animals suddenly brought together there will be many inferior ones, on whom poor food and continuous hard work will soon tell.

For horses and mules the weight to be carried is generally given at 200 lbs., pack saddle included. In the Abyssinian Expedition the load carried by mules had to be reduced to 100 lbs., not including the pack saddle. It may be assumed as a rule that from 150 to 160 lbs., in addition to the saddle, is a fair weight for pack animals doing continuous work on inferior roads.

Pack transport was extensively used by the British Army in the Peninsula, but of all transport it is acknowledged to be the most troublesome and difficult to arrange; it has, besides, the great disadvantage of lengthening out considerably the column on the march. Occasions will, however, occur where most of the transport must be of this description.

The animals used are horses, ponies, mules, donkeys, camels, bullocks, and elephants.

The horse amongst us is too well known to demand a special notice, though he is not generally used by us as an animal of burden. Horses for

The Horse.

* When pack animals are loaded before a regiment marches off, in cases where the baggage is not to follow immediately, the animals may be loaded for one or more hours before they are actually put in motion.

this purpose should be strong, compact animals, between 14-2 and 15 hands in height.

When few horses are on board ship, in stalls on the main deck, and there is sufficient room on either side of the mast, it will be found an excellent plan to lay down a rough cocoa-nut matting and exercise the horses round in fair weather. This will help much in keeping them in fair condition.

The Mule.

Mules are of two kinds; the cross between the ass and the mare, which are the most valuable, and that between the horse and the she-ass. Those of the first kind bray, whereas those of the second neigh. Mules can be worked from four to twenty-five years of age, and even more; their common height ranges from 13 to 15½ hands.

Mules are hardy, sure-footed animals, and in mountainous countries are more useful than horses, being capable of carrying equally heavy burdens and enduring long-continued fatigue. This animal has some excellent qualities; he is strong, frugal, slightly affected by the heat, is easily fed, and equally good for burden and for draught. He is long-lived and seldom sick, though his infirmities are generally acute; but he is easily alarmed by the noise of firing.

Female mules are best, as they are very docile and well adapted for burden. Entire mules are vicious and carry loads badly. None under four

or over seven years of age should be purchased. In the Peninsular War and in Abyssinia mules were extensively used as pack animals, and in the Crimean War they were used in the Land Transport Corps for draught. In India they form part of the permanent transport of the Punjab Irregular Force, and are used as pack animals in the mountain batteries. They have also been largely used in the many expeditions which have taken place on the North-Western Frontier.

The mules for the Crimean Land Transport Corps were purchased in the Levant and Spain; those for Abyssinia came from various countries, such as Spain, Syria, Egypt, Persia, India; and Abyssinia itself supplied a small number. Of all these, the Spanish ones did not answer as pack animals, though some did good service in harness. They were badly bred, and soon fell into low condition when the dry and coarse forage of the country replaced the fresh grass they had been accustomed to.

The animals from Egypt, Syria, Persia, and India, thriving on little grain and coarse grass, were more hardy and more enduring. Those purchased for the Lahore Mule Train for service in Abyssinia came from the Punjab districts, from Jhelum to Kurnal, and from Simla to Sirsa. The Sikhs, Pathans, and Farsewans of the travelling Afghan tribes, as also the Koomiars of the Punjab, make good muleteers.

Driving mules has been found to answer better than leading, particularly on bad roads and mountain tracks. The animals will follow the leading one and the sound of his bell more freely than if tied head to tail together in batches.

Mules have dainty habits about drinking water; they will often not drink good water out of a brook which has been muddied by other animals.

Harness for mules requires to be strong and well made. A mule pad weighs about 34 lbs., and complete with saleeta bags and loading ropes the weight comes up to about 48 lbs.

Ponies.

Pack ponies are nearly as good as mules for transport purposes, but the saddles for them should be made to fit them carefully in the first instance. In the Native Cavalry in India very small and badly-bred ponies are used to carry the kit of the troopers on the march, and provide the horses with grass when in cantonments; these poor animals, badly fed and looked after, make very long marches with heavy loads, and come into camp generally not long after the arrival of the regiment.

Those from the hill districts in India are very good; they should be driven as recommended with mules.

Colonel Haly in his pamphlet on the Abyssinian expedition says: "I would strongly recommend the

Pegu pony. These high-bred, plucky fast, and docile little animals are first-rate in draught, and will carry as heavy a weight as the largest horse; and as they horsed the mountain train attached to the Malabar Police Corps when under my command, I can speak with certainty as to their fitness for that work."

Donkeys.

Donkeys are capital animals for transport if not worked too young and if of good size and breed; they are very enduring, do not require much food, and four or five can be placed in charge of one man.

The ass is sure-footed and easily maintained. The Spanish is double the size of the ordinary English; as a general rule, the ass is large and sleek-haired in warm countries, small and woolly-haired in colder ones. Asses are used more in the East for carrying burdens and for saddle than in Europe.

The load for a donkey should not exceed 100 lbs., and none under four years of age should be purchased for service.

Camels.

Camels are used in India more than any other animal for Military Transport service. There are two species of this animal—the common or Arabian camel, which has one hump, and is now largely domesticated in India; and the Bactrian, which has two humps. The Arabian is the more valuable of the two, and can store up a considerable

amount of water for future use. Once accustomed to journey across the arid and sandy deserts and wastes, experience teaches him to lay by a greater supply of water than would be accumulated by a young and untried animal. A large camel of this kind, taking five or six gallons of water into his stomach, can exist five or six days without drinking. Camels receive no injury to their palate from the thorns and hard food they eat, and their feet are well adapted to maintain a firm hold of the shifting sand. The Bactrian camels require liquid every third day.

The ordinary height of a camel is from six to seven feet at the shoulder; the highest speed of a lightly-loaded animal is three miles per hour, but as a general rule it does not amount to more than 2½ miles. A heirie, or swift camel, seldom does more than eight miles per hour, but the animal is so enduring as to keep up this pace for a period of many hours.* The stride of a camel varies from 6′ 6″ to 7′ 6″; he is a bad mover over stony or wet ground: in the first he soon gets footsore; in the second he cannot obtain a secure hold of the ground—he either falls, or his legs separating widely apart cause him fatal injury.

Camels can carry a load of from 300 to 400 lbs., according to their size. They are cheap to main-

* In riding long stages on a very fast camel it will be found a great comfort for the rider to wear a wide roll of cloth, or *cummerbund*, tightly wound round the waist for support.

tain, are easily fed and managed; they are, however, difficult to transport by sea, are delicate animals,* and require careful looking after and doctoring. Young camels are unfit for rough work. The lowland camels cannot stand the severe climate of cold countries, and, *vice versâ*, the hill camel suffers a good deal from the heat of the plains. The great mortality amongst camels in the Afghan campaign, in Scinde, and in Abyssinia was principally due to this fact, and to many, in the first, having been poisoned by feeding on the oleander bush.

In the expedition to Afghanistan of 1839 the army lost in the march from Ferozepore to Candahar no less than 20,000 animals. Most of the transport animals for the expeditionary force were lowland camels—about the worst possible animals to use with an army in the front at all times, but especially when operations were to be carried out in a cold and hilly country. As a baggage animal in a plain country, working between depôts or with reserves, the camel is invaluable, but certainly ill suited at all times to accompany an army making long and rapid marches, for which purpose mules and ponies are very much preferable.

An officer who accompained Sir Richard England's column in its march through the

* "The treatment of sick camels appears to be little understood." (Sir C. Napier.)

Bolan Pass to Quetta, Moostung, and Khelat describes the transport arrangements for that column as follows:—"The transport was partly hired and partly purchased by the Commissariat Department. Camels only were used, a certain number of which were attached to corps whose Commanding Officer told off a small party to look after them under the general superintendence of the Quarter Master. Convoys coming through the Bolan with Commissariat supplies were looted, and, one way or other, from want of military organization and system, it was found at the end of a year, or a little more, that out of 10,000 camels which had been purchased by the Commissariat, very few remained. The order was that, if a camel died *en route*, the Commissariat Conductor, or other subordinate in charge, should bring in either the tail or the mark (which was burnt on the neck), as a proof of the fact; and the result was that heaps of tailless camels, &c., were afterwards found amongst the people of the country, our people having abandoned them because a little tired, and swore they were dead; or perhaps they had sold them."

Sir. W. Nott gives the number of camels that accompanied the 10,000 men to Afghanistan as having amounted to 30,000. Campaigning in a cold climate like that of Afghanistan, there is no reason why the troops should not return to their European habits of attending entirely to

their own wants and carrying their kits; the cumbersome Indian tents might be replaced by a lighter and more portable article, and the reduced baggage carried entirely by good strong ponies and mules.

Napoleon formed a dromedary corps for his expedition to Syria. Following his example, when Sir Charles Napier found himself at the head of an army in Scinde (a country well adapted for camels), he raised a camel corps, which was revived during the latter part of the Indian Mutiny, and did good service in the Central India campaign. Each camel carried a driver and an infantry soldier. The camel corps could make very long marches, at the end of which the soldier, comparatively fresh, could dismount and fight on foot; it was therefore impossible, even for the lightest troops, to try and escape.

The camels attacked by superior numbers could form a ring, facing inwards, and the drivers, who were also armed, could keep the enemy off from behind this living redoubt. The camels carried the men's things, bedding, provisions, &c., which rendered the corps free and independent. The weight of a double camel saddle is about 133lbs.

The following extract from Sir C. Napier's *Administration of Scinde* shows how very useful a camel corps can become on an emergency:—

"No sumpter camels had yet been procured, and

the General, thus pushed to the wall, detached Fitzgerald's fighting camel corps to fetch food from Shahpoor, with orders to scour the ravine of Tonge once more during his march, and even to attack that place if it contained enemies. The military excellence and power of this anomalous corps were then strikingly shown. With hired sumpter camels the marches alone would have occupied six days and nights; and a strong escort must have been employed to protect the convoy. Fitzgerald's men, self-supported as a military body, not only scoured the ravine and reached Shahpoor in one night, after a march of fifty miles, but loaded their camels with 45,000 pounds of flour and regained camp on the morning of the 8th, having employed but three days and two nights in the whole expedition!"

Camels have also been used to convey reinforcements rapidly on an emergency, two men riding one on each side in *kajawahs*, which are large square boxes with a wooden framework, about 4½ ft. long by 3½ ft. broad; the sides of this framework being covered with gunny cloth or rope matting. Sick men have been carried in kajawahs; but the motion of the animal forwards and backwards at every step he takes makes it very uncomfortable for sick men.

Another, however, and a very important use to which camels have been put, is the forwarding of letters and despatches by riding camels. These

animals will trot seven and more miles an hour on fair roads, and will go for many miles without showing any signs of distress. Most corps of Native Cavalry in India are provided with one or more Shooter Sowars per troop for this duty.

Light field-pieces are also carried on camels, four animals being told off to each gun—one for the piece, one for the iron carriage, one for the wheels, loading rods, &c., and the last for a pair of ammunition boxes.

With the army of the Indus there was a field battery of 9-pounders drawn by camels, and Sir Charles Napier in his march to Emaumghur had also a camel battery with his force. A particular description of animal called the baugree is employed for draught. The first battery was raised by Major Pew, Bengal Artillery. Four camels were attached to each gun and limber; but it was suggested in the Afghan campaign, where the battery was first used on service and found to work well, to have six camels for each gun and limber, and to carry the ammunition on pack camels and not in tumbrils.

These various uses to which camels have been put do not strictly come under the head of transport, but are mentioned here to show how very useful these animals can be made in countries suited to their movements. The advantages they possess in such countries are, that they can go longer without water than the horse or mule;

in most of these they are easily fed, and no forage has to be carried for them, and they do not suffer from extreme heat.

The weight of their equipment, consisting of baggage saddle, saleeta bags, and ropes, amounts to about 48 lbs.

Bullocks.

Bullocks are used for draught as well as for pack; for the first their movements are very slow, their pace hardly exceeding 1½ mile per hour. Pack bullocks will carry about 160 lbs., moving with that load at the rate of 2 miles per hour.

The Duke of Wellington in his campaigns in India, at the commencement of this century, had most of his transport done by pack bullocks; but his despatches are full of complaints against the Brinjarees * who supplied him with cattle, and go clearly to show on what a precarious transport his military operations were carried out, as the men, though well treated, broke their engagements with him, sold the stores confided to them, and deceived him in every instance.

Bullocks are much used in some parts of India as pack animals, but are not desirable as military transport, as they soon fall into bad

* The Brinjarees are a special caste of carriers in India, generally from Bundelkund: their occupation is conveying large quantities of grain by means of pack bullocks all over the country.

condition if not supplied with abundance of food and water. The animals will straggle in search of forage, and cause thereby serious inconvenience on the line of march.

Draught bullocks require no harness; the equipment for pack bullocks consists of saddle, saleeta bags, and loading ropes, in all weighing between 50 and 60 lbs.

Elephants are largely used for transport in India. The female animals are preferable to the male, as these last are liable to get "*musty*," and give a deal of trouble whilst in that state. With a load of 1200 lbs. the pace of an elephant generally averages 3½ miles per hour.

Elephants.

Sir S. Cotton, in his *Nine Years on the N. W. Frontier*, says he prefers elephants for carriage, even in a mountainous country; however, in such a country elephants are slow movers and are apt to get footsore. In Abyssinia they carried the mortar battery and Armstrong guns, carriages, limbers, and ammunition over the difficult and mountainous parts of the road, the loads varying from 8 to 16 cwt.

On service they are useful in drawing heavy guns and mortars, and have also been used in carrying troops on an emergency, each elephant carrying six men—two on each side, one in front, and one behind. They are also particularly well adapted to carry the large and heavy tents used in India.

Elephants require clean and wholesome food in sufficient quantity, and at such time as not to interfere with their rest at night. They should receive plenty of green food, which, however, is not procurable in every country. They should be picketed during the cold and wet seasons in a dry and open spot, but in the hot months they should be sheltered, if possible. They should be washed and water given to them twice a day. The elephant takes about fifteen gallons each time, and cannot go without water for more than twenty-four hours without injury. Their equipment consists of a large pad, straps, saleetà bags, ropes and foot chains, &c., the whole weighing about 314 lbs.

Wheel Carriages.

Whenever there are roads suitable for wagons, carts, &c., this description of transport will be found preferable to any other. Two pack mules will carry from 320 to 400 lbs., a man being necessary to look after them, but the same two animals will draw in a wagon a load from 800 to 900 lbs.; the adoption, therefore, of wheel carriages in preference to pack animals will tend largely to reduce the transport of an army. Carts are also more orderly on a road than long strings of pack animals; and of all transport for an army, the four-wheeled wagon is undoubtedly the most important.

The description of wagons or carts to be used

will depend upon a variety of circumstances, and it is on this account that in almost every campaign or expedition we see a different kind adopted for use, although all no doubt possess special points of recommendation in their favour. Thus we see in the Kaffir War lumbering wagons drawn by ten or fourteen large bullocks, the teams led by naked little foreleaders and driven by small Hottentots using enormous bamboo whips eighteen to twenty feet in length; in the war in New Zealand, two-wheeled carts used, with one horse in the shafts and a second horse leading; in the American War, long wagons drawn by six horses or mules, and driven by one man mounted on the near wheeler. As countries differ greatly from each other, their nature and general state of the roads alone can determine the most appropriate kind of wheeled transport suitable for each. All carts, wagons, &c., particularly those for use in the East, where the animals as a rule are much smaller than at home, should be of a light description—strong, no doubt, but never of such cumbersome construction as to conduce to waste of strength in the cattle required to draw them. If made much after the pattern of those in use in the country itself, and horsed in the same way, they will be found generally to answer well.

See Appendix

"The general carriage of the country in which an army is campaigning should be used as much

as possible, not only because it can be more easily replaced, but likewise that it is generally more suited to the locality, and is sure to be better acclimatized, and consequently more healthy; therefore, however inferior it may appear, yet as a rule it will be found by far more efficient than would be most imported *matériel.*" (Colonel Haly.)

The power of draught of transport horses on good ordinary roads can be calculated at about 9 to 10 cwt. per horse.

The nature of the country itself generally determines the description of transport most convenient for use, and on what is found to answer well in time of peace should be in a certain way modelled the transport in war. If the country is intersected by good metalled roads, wagons and carriages will constitute the principal portion of the transport. Where the roads are stony and bad, and the country is mountainous and intersected mainly by tracks, mules and pack animals of all sorts will be used. In desert and sandy countries, camels will be found to answer best; in others, where animals are scarce or the nature of the country is too rough for them—as, for example, on the coast of Africa, or the hilly regions on the eastern frontiers of India—carriers will form the bulk of the Transport Corps.

Besides the fair or rough state of the country,

and the abundance or want of good roads, the weather, according as it is wet or dry, will have some influence over the amount of transport required.

In the China and New Zealand Wars the wagons and carts supplied from home or from the Military Store Department were found to be inferior to those obtainable in the country; the same complaint was made regarding the harness supplied from England in the first of those wars.

It is impossible to adopt at home a description of wagon or cart and make it applicable to all countries alike. Those in use at home are too heavy for the small animals of the East; the harness * also is made for a larger description of animals—it does not fit, and requires an immense amount of alteration and re-making. *See Append.*

The Maltese cart drawn by mules has been found very well suited for service with an army in the field.

The Abyssinian War afforded ample experience with regard to pack saddles and mule pads; Pack Saddles.

* Each division of wagons, ambulances, &c., should be provided with a certain number of breast straps, in addition to the regular harness, for horses that have been rubbed by the collar, or chafed in the flanks by the traces. This will permit of these horses being worked whilst their wounds are healing. The breast straps are not as good as the collar for draught animals, for, where in the last the horse feels the weight only in front of his shoulders, in the first the chest is compressed, the shoulders are forced inward, and much of the horse's power is neutralized by the weight pressing both before and on the sides.

in that expedition the Otago saddle * and the Punjab mule pad proved the best of all that were tried; the first weighs 43 lbs. and the second 34 lbs. Preference was given to the pad as being more easily repaired, better capable of being fitted to animals of various sizes, simpler, lighter, more economical, and packed with greater facility when not in use.

In the New Zealand War the Otago saddle was highly approved of by the Transport and Commissariat Officers. In China, a strong, light, and easily-repaired saddle from Manilla, made of bamboo, was found to answer well, and the Indian mule pad with saleeta bags was also much in favour.

The saleeta bags are large pieces of stout coarse canvas, furnished with eyelet holes all round, through which runs a rope; when the rope is tightened, it assumes the form of a bag, and is particularly useful to carry miscellaneous articles.

Captain T. J. Holland, Assistant Quarter Master General in Abyssinia, in his report on saddles, advocates one used in Mexico called the apparejo, which he describes as a large pair of leather saddle bags filled with straw; with these saddles in Mexico one muleteer attends on the march on eight mules.

He states: "The advantages of a pack saddle

* It forms a good riding saddle.

of the above description are that its cost is but little; large numbers can be packed in a comparatively small compass and sent to the port of debarkation; each mule can carry a spare pack saddle unstuffed. Repairs can with facility be effected. Its size distributes the weight of the load over the whole of the animal's back. It is not liable to turn. It serves as a covering at night for the mule, and, by care and attention in arranging the straw stuffing, ought never to cause galls or sore backs." *See Appendix.*

Drivers.

To keep animals in good health and fit for work it is particularly necessary to have good drivers —men who possess a fair knowledge of the animals they have to attend on; no more animals should be placed under the charge of one man than he can well look after.

Elephants require one mahout, or driver, and a boy; one driver is necessary for each pair of ponies, mules, camels, and draught bullocks; one man can look after five or more donkeys; experienced drivers are required for pack bullocks, and one good man can look after a large number of them. Proper interpreters to convey orders to the drivers, and to make known their complaints to their officers, are indispensable.

The great advantage of having officers and non-commissioned officers acquainted with the language and customs of the men would be

attained in any expedition sent to Egypt, the Persian Gulf, the East Coast of Africa, and China, by employing only drivers from India, independent altogether as to whence the animals are obtained.

RATIONS FOR TRANSPORT ANIMALS.

Draught and Pack Horses.

10 lbs. oats.	8 lbs. oats.
12 lbs. hay.	10 lbs. hay.

In India.

Arabs.	Colonial.
8 lbs. gram.	10 lbs. gram.
30 lbs. grass, or	30 lbs. grass, or
15 lbs. hay.	15 lbs. hay.

Mules and Ponies.

10 lbs. barley or 5 lbs. gram.
12 lbs. chopped straw or hay.

Bullocks.

6 lbs. barley or 4 lbs. gram.
12 lbs. chopped straw or hay.

Camels.

9 lbs. barley or 5 lbs. gram.*
12 lbs. chopped straw or hay, or leaves of trees when procurable.

* One lb. of flour mixed with ghee (clarified butter) is worth double the quantity of grain. In the march through the Bolan Pass in 1839 some of the camels, private property of the officers, were preserved by being fed with *flour*, goor (sugar), and ghee; a mode of feeding used for Suwaree (riding) camels.

Elephants.

25 lbs. flour.
2 oz. salt.
100 lbs. green food, or 175 lbs. hay.
15 lbs. firewood allowed for each animal.

The description and quantity of forage, the time and manner of feeding generally adopted in the country of operations, should be followed as much as possible, as this has in most cases been found to answer best from long experience. On the subject of forage in the Afghan campaign Major Hough gives the following information:

"The Afghan horses eat green forage (lucerne &c., chopped up with bhoosa) in great quantities, and seldom eat any grain. The Toorkmuns prefer dry food for their horses, and give from 8 lbs. to 9 lbs. of barley a day. If green barley be given, the horse has no grain. Clover and artificial grasses are used for feeding horses, and are given in a dry state. Juwaree (*Holcus sorghum*) is preferred, it contains much saccharine juice." (Burne's *Bokhara*, vol. 2, page 272.)

"The cavalry, &c., gave clover dried (when procurable), mixed with grass, when they could not obtain bhoosa. Large quantities of clover given alone is considered bad for horses. Even barley is a grain which, in its whole state, gives but little nourishment, and is particularly bad if the barley be new; and of gram we had not had

one grain for more than two months. Recourse was had to frying the barley, and, sometimes, making it into flour, or to boiling it; but this could not be done for 2500 horses.

"The Toorkmuns usually give the barley-flour made up into balls, with the fat of the doomba sheep. Even the camel-men gave balls of this kind, mixed with water, declaring that 4 lbs. in this form were of more nourishment than 8 lbs. of the barley whole. In fact, it was observed that the barley passed through the horses and cattle in a whole state."

Both in Scinde and in Abyssinia numbers of poor men, women, and children were seen picking from the dung of the cattle the undigested particles of grain, which, when cleaned, they used as food for themselves!

TRANSPORT OF ANIMALS

BY SEA TO PORT OF DEBARKATION.

Owing to the peculiarity of our insular position, all our wars and expeditions take place far away, some thousands of miles from England. In the East also our most important expeditions are not generally those sent across the frontier, but the ones fitted out in India for service in some distant country. It follows from this peculiarity that we have either to organize a Transport Corps on landing in an enemy's country, or in that of an ally we desire to protect and defend, or else we have to organize one at home, in India or elsewhere, and forward it to the seat of war.

Always, when possible, it will be the best plan to organize one previous to its being despatched to the seat of war; there the services of such a corps will be immediately required, and a previously organized one will, after landing, be available for almost immediate work.

To provide against loss of animals on the passage, and for all being landed in a fit state for work, certain arrangements are necessary, and the following appear to be the ones demanding particular attention :—

A commandant and staff sufficient for all requirements should be established at the port of embarkation, or wheresoever the transport depôt is formed, where the animals and *matériel* would in the first instance be assembled, where the corps would be organized, and thence forwarded to its destination.

Contracts for animals and equipment may be entered into in any of the neighbouring markets, but every article for the transport should be forwarded by the contractors to the depôt.

At the depôt the men should be enlisted, attached to divisions, clothed, and equipped; the animals fitted with their harness or saddlery; the superintendents and drivers practised in fitting saddles, loading and unloading, greasing harness, slinging and unslinging animals, and other useful work.

Whilst this work of organization proceeds, the proper authorities will engage the shipping necessary to convey the corps to the port of debarkation. The ships chartered for the conveyance of animals should be roomy, well ventilated, and, generally speaking, built for voyages in warm latitudes. Vessels with 30ft. beam allow of a row of stalls on each side with a passage of 10ft. or more in the centre and 3ft. between the side of the ship and the back of the stalls. Any ship whose breadth of beam is less than this is not well suited for animals. The hatchways should

not be less than 10ft×10ft., and the tonnage is calculated at about 10 tons per animal. In fair weather animals can be conveyed in sailing ships towed by powerful steamers. The height between the planking of the decks should never be less than seven feet; the animals, if possible, should be on the main deck. Plenty of ventilators, of the most approved construction, should be provided, care being taken that these are always kept working; ships provided with bow ports are preferable to those without them. Stalls* 7ft. long and 2½ft. wide from centre to centre of stanchions, should be fitted up, with a clear space of from 3½ft. to 4ft. in rear of the stalls, to enable the men to clean the animals properly.† Each ship should have ten per cent. of spare stalls, and some on deck, where sick animals requiring fresh air may be removed to, for the purpose of recovering. This last arrangement should never be neglected where there is the available space.

The drivers require a compartment of the ship to themselves, quite distinct from the animals, and with no communication between the two. The forepart of a ship, being generally the coolest, is best adapted for the men; the animals should be amidships, and as much in the centre as pos-

* Cross battens should be placed directly beneath the side boards, so as to allow the urine to run off.

† Stalls for draught bullocks need not be more than 6′×2′, and for pack bullocks 5′×1¾′.

sible. The water tanks should be in the hold, and not on the animal decks, water being drawn by means of pumps. Water will be required at at the rate of six gallons a day per animal in hot, and five gallons in cool weather. Camels and elephants require more.

Each ship should be provided with the following articles, viz.:—

6 shipping slings.
6 head pads to use in slinging.
1 head stall per animal; fifteen per cent. spare.
1 hay net per stall.
1 scraper per stall.
50 per cent. of brooms, with a reserve.
50 per cent. of baskets, with a reserve.
1 gallon of vinegar per animal.
50 per cent. of buckets.
10 per cent. of lanterns.
7 lbs. chloride of zinc per day.
4 lbs. MacDougall's disinfecting powder per day.
1 Coir mat per stall; others for use in shifting horses.
25 to 30 horse hammocks or resting slings.
2 tubs for soaking grain.

A veterinary surgeon, native farrier (Solutree), or cattle doctor, should be on board of each ship, with a store of medicines. The animals should be embarked in the same ship with their drivers and equipment complete. All drivers should be

medically examined before embarkation; and no animal should be embarked that shows any symptoms of suffering from a contagious disease. Drivers on the passage should be told off for duty to remove dung, sweep up litter, and watch the animals.

When the transports for the animals are ready to put to sea, the equipment should be sent on board first; the articles required first on disembarking being put on board last. The wheels of all carriages should be removed (the linch-pins and washers being carefully stowed away), and the carriages should be lashed and made fast. It the depth of water is sufficient to allow the ships to come alongside quays or wharfs, the animals can either walk on board, which is the easiest way, or be slung on board, the yard being brought plumb on the shore; if the ships are out at sea, large flat-bottomed boats will be required, capable of accommodating about forty animals, and fitted with handrails. These boats can be towed alongside the transports, and the animals slung on board from the main yard-arm.

Animals before embarking should be kept fasting for some hours, to prevent any injury being done to their distended stomachs whilst being hoisted on board. They will thus more readily take to their food after being put on board, and will soon get reconciled to their new quarters. The hind shoes of horses and mules should be always removed before embarkation.

With all appliances complete, and men used to the work, from thirty to forty horses or mules can be easily slung on board in one hour. Each animal, with his watering bridle on, is brought close to the ship; the head pad and slings are quickly attached and secured; and before the animal has time to plunge he should be hoisted off the ground or boat at a rapid rate. The watering bridle will come in useful to manage the animal, once on board, and can be removed after he is secured in his stall.

The hatchways should be padded, if possible, and a soft bed of straw prepared for the animal to alight on. Five men are necessary to sling an animal well; two or three should be about the hatchways to see that the animal's head, tail, or legs are not injured in the descent to the stable deck, and three or four more to receive him there and take the slings off. Animals on reaching the deck should be judiciously handled; for they will generally plunge and kick violently on first feeling their legs. The head pad and slings are removed and passed on shore for other animals, and the animal is taken to his stall, where he should be placed in the same order as he stands in the lines or stables, for animals feel happier and feed better when standing close to those they are accustomed to be with.

The animals should be groomed daily, and every attention should be paid to the food and

watering. The spare stalls are particularly provided for the convenience of cleaning the animals; they can thus be shifted, rubbed over, and have their feet washed. The mouths, nostrils, and occasionally the hocks, particularly of sickly animals, should be sponged with vinegar.

The drivers should in very rough weather stand at the animals' heads, to reassure them. Coir mats will be found useful in rough weather, but should only be used then, and taken up and dried as soon as no longer required, otherwise they will stink and become full of insects. When no coir mats are furnished, fine cinders or sand should be sprinkled over the floor of each stall.

Food for the first few days should be given rather sparingly, and bran should form the larger portion of the diet; when the appetite of the animals increases they should be fed more liberally.

SCALE OF SEA FORAGE FOR ANIMALS ON BOARD TRANSPORT SHIPS.

Horses.

Oats	6 lbs., or 5 lbs. gram.
Bran	1 lb.
Hay	10 to 14 lbs.
Pepper	½ oz.
Water	5 to 6 gallons.

Ponies, Mules, and Asses.

Gram	4 lbs.
Bran	10 oz.

Hay	10 lbs.
Pepper	6 drams.
Water	5 gallons.

Camels.

Gram	4 lbs.
Forage	30 lbs.
Water	8 gallons.

Bullocks.

Gram	3 lbs.
Straw or hay	12 lbs.
Water	6 gallons.

Elephants.

Gram	4 lbs.
Rice or flour	20 lbs.
Salt	2½ lbs.
Hay or kirben	175 lbs.
Water	40 gallons.

Water should be given three times a day, viz., in the early morning, at 11 A.M., and again at 3 P.M. When within a few days of landing, the full ration of forage may be given, to get the animals in working condition. No transport animal should be worked immediately after landing; time should be allowed for his recovering from the effects of the passage.

The utmost possible attention should be given to cleanliness on board the ships, disinfectants being used freely. Chloride of lime in contact

with urine becomes offensive, and should not be used, the exhalations being injurious to animals. Chloride of zinc, two pounds, mixed with five gallons of water, will be sufficient for bilges, the bilge water being diluted with fresh water and pumped out before pouring the chloride of zinc. MacDougall's disinfecting powder, three ounces to one gallon of water, sprinkled through the rose of a watering-pot, will be found sufficient for decks. If used dry, a good-sized dredger will be required; for latrines, five to eight ounces of powder to one gallon of water will be ample. Old blankets, or other woollen substance, saturated with a strong solution of MacDougall's powder and hung up where the atmosphere is offensive between decks, will soon purify it.

When the decks are not painted they should be whitewashed every tenth day. The stalls themselves should never be whitewashed, as the lime will injure the skin of the animals, but they should be washed daily, and the precaution of shifting the animals daily in fine weather should never be neglected.

The men's quarters also require to be whitewashed frequently, and a cook-house built on deck. Indian drivers are particular about matters of caste, and for them particular arrangements require to be made.

On arrival at the port of debarkation, the harness and pack saddles should be sent on shore

first, then the wagons or other carriages, the animals being disembarked last of all in boats, which will be generally provided by the debarkation officer. The senior transport officer should remain on board to see that everything is cleared off the ship, the next senior proceeding to the landing-place to superintend the landing and to get the animals saddled, harnessed, and hooked in and ready to move off, for it will always be desirable to clear the landing-place as soon as possible. Great order and regularity should be observed on landing to avoid the confusion which otherwise is sure to arise. The commanders of squads should see that the saddles, harness, and carriages of their squads are collected together, and the animals are moved up to them as soon as landed, and that the drivers lose no time in saddling and harnessing without noise. When the division is ready, the officer commanding it will march it off to the encamping ground, or other locality assigned for it by the debarkation officer.

VARIOUS OPERATIONS

CONNECTED WITH THE TRANSPORT OF AN ARMY.

A Transport Corps may either be a permanent corps kept up in time of peace, and expanded to meet the requirements of an army sent into the field, or may be a corps raised entirely for the occasion, to be broken up and disbanded when, the operations of the army having come to an end, there will be no further need of its services.

The raising of a transport corps of the second kind entails various important operations which demand a large expenditure of money; the principal ones are —

1*st*. Purchase of transport animals.

2*nd*. Purchase of carriages, harness, saddlery, equipment, &c.

3*rd*. Enlistment of drivers and the necessary establishments to work the corps.

4*th*. Transport of animals, drivers, and equipment to the port of debarkation.

These operations entail such a large outlay of money that it will be always desirable to limit as much as possible the strength of this corps. In some countries, however, where the means of transport are either entirely wanting or insuffi-

cient, there will be no other course to adopt but to raise a Transport Corps of this description.

A Transport Corps not being kept up, for just motives of economy, during peace time, will entail extra expenditure of money when the time arrives for preparing one; for the large number of animals and stores of all kinds will have undoubtedly to be purchased at enhanced prices. Where the time is also limited, one must take what can be purchased in the open markets, which often will not be of the best description.

The regular transport must be supplemented as much as possible by auxiliary transport, to release it and enable it to keep its proper place with the army in front. This auxiliary transport may be obtained by contract, as would be the case when operations are carried out in a friendly or allied country, where it is desirable to abstain from forced requisitions; and either by paid or unpaid requisitions in invaded and hostile countries.

See Appendix L.

Transport by contract is always preferable to that requisitioned, and with regard to this last it must be noticed that in requisitioned transport there will be many bad carts, and many bad, useless animals, entirely unfit for long marches. The superintendence for this kind of transport requires to be military, and on a sufficiently large scale to provide against the desertion of the drivers and the loss of carriage. When we must have recourse to requisitions, it will be found the

See Appendix M.

most judicious plan to pay the men, and pay them also well, so as to retain both the owners and the drivers through their love of gain.

The same individuals should not be retained too long, for the men will then remain more willingly, whilst also, by frequently renewing the animals, carts, harness, &c., these will be in a better condition for the work required. All promises with regard to pay and duration of service should be strictly fulfilled, otherwise the men will desert in large numbers, whatsoever may be the risks they incur by doing so.

The following extract from a small pamphlet by an officer of the Bavarian Etappen Inspektion, from notes collected during the war of 1870–71, with regard to auxiliary and requisitioned transport, will convey useful instruction on this important subject :—

"Before undertaking the formation of extensive magazines, one must feel sure to be able to collect large quantities of supplies, and to have the means of having them conveyed in every direction. For this object good transport parks must be organized in good time. This important question is deserving of a special study.

"Many States have a law of conscription for horses; Bavaria is in the number of those which do not possess such an institution. In the first of these the state levies the horses and furnishes wagons and drivers, generally taken from the

Landwehr; ordinarily two hundred carriages are placed under the orders of a senior subaltern officer, assisted by some non-commissioned officers (who in Prussia are often young landowners), some mounted soldiers of the train, some farriers, and saddlers. This institution is excellent, as it enables them to have columns ready to march at the same time as the troops.

"A portion of these parks marches with the various corps; the other (generally the largest) remains under the orders of the General Etappen Inspektion. The wear and tear of these parks in men and in material is very considerable, because these are always on the march, even in most stormy weathers; they go seldom into quarters, and have generally hurriedly-prepared and indifferent food. It is not a pleasant service to be every day on the road, often until the middle of the night, exposed to all weathers, working constantly in attending on tired horses, and to remain whole months without lying under the shelter of a roof and without getting a substantial meal.

"The Etappen commands can do much to remedy these hard necessities. In the last war, from the end of September to the beginning of January, no steps were taken with regard to this subject.

"When the parks are insufficient, the Civil Commissioner and the General Etappen Inspek-

tion demand the forwarding of new reinforcements, or form parks with carriage requisitioned in the enemy's country; in this last case the Civil Commissioner issues the necessary orders. He comes to an understanding with all the new civil functionaries of the district which is to furnish the requisitioned carriages; they cause requisitions to be served by the local authorities, if necessary getting assistance from the Etappen troops; the carriages are collected in a certain locality fixed by the Etappen Commandant; this last superintends the maintenance of the park, obtains receipts for the articles he furnishes it with, and forwards it immediately with a sufficient escort to the locality appointed for the park.

"Acting in a different way, one would risk not getting more than one-half of the carriages asked for; also the drivers would exchange on the way the good ones they have for the worst they could find. The local authorities find a thousand pretexts to repudiate all responsibility, and of what use are then all punishments and fines? It is not by means of money and notes that one will make despatches without carriages. Requisitions during the last war have shown plenty of room for improvement, but the fault lay more with the individuals than with the system.

"When one requisitions in an enemy's country hundreds and thousands of carriages, he should

attend to give them a sufficient escort, to feed the drivers, in winter to give them warm clothing and a small salary. The escort and leading of these parks is entrusted to officers and *employés.*

* * * * *

"The Intendant and Staff Officer should know intimately the strength of their park and the services it is able to perform, so as to issue only reasonable orders for the conveyance of supplies in every direction."

Where transport can be obtained by contract, all the obligations of the Government and contractor are entered in the agreement. The contractor furnishes the animals, carriages, drivers, superintendents, &c.; as a rule, he attends to the feeding and the foraging, and to the payment of the drivers, the shoeing of the animals, repairs of all kinds, and replacements that become necessary from time to time during the duration of the contract.

Requisitions may be demanded from place to place, from day to day, or for a limited number of days. At the completion of the service the carriages and animals should be returned, the drivers furnished with a certificate showing where they came from, and on what work they have been employed; this will save them from being pressed again on their return to their homes. In serving requisitions for transport, a larger number

of carriages and animals than actually required should always be demanded, to be able to discard any that do not appear fit for the work to be undertaken.

The second line of transport, working between the base and the most advanced magazines, can be worked either by direct convoys or by relays. The staging system by relays has the advantage of rapidity; if relays of animals are placed on the road at regular stages, a convoy can march by day and by night, and accomplish two or three ordinary marches in the twenty-four hours.

This system can be employed with advantage when magazines have to be established on any principal line of communication deficient in railways, or when it becomes necessary to quit a railway at a certain part of the line to carry on operations at some distance away from it.

The advantages of the staging system are many. The drivers and animals always working on the same part of the road, on one they are well acquainted with, work more cheerfully and are less fatigued. They are always well fed, well sheltered, and in good trim. The men being near their own places of abode can feed themselves and their animals, thus relieving the Commissariat of all care regarding their subsistence. A larger quantity of provisions can be conveyed in a given time to a certain place. The return journey allows of comparative rest to the animals

every other day, and with spare animals a certain number each day need not quit the stables. In cases of requisitions this system does not press as heavily on the inhabitants as sending their carts and animals far away from their homes.

The conductor of the convoy should in all cases proceed in charge of it right through the several stages, and should be answerable for the correct delivery of the stores. With requisitioned carriage the stores will have to be unloaded and reloaded at each station, which will cause a loss of time.

In removing a large number of wounded after a battle,* or when a flank movement of the army necessitates a change in the line of communication, or a retreat the hasty removal of magazines, then the system of direct convoys becomes preferable to that of relays.

In every case the officers in charge of posts on the line of communication must obtain full know-

* The Auxiliary Transport can render great services in return journeys, by removing the sick and wounded from the hospitals in front, which will permit of these being in a state to receive fresh admissions. After a hard-fought battle, or in cases of epidemic, the admissions into hospital will be very numerous, and will require the continual removal of the first sufferers to the rear, to be distributed among the hospitals at the base or on those established along the line of communication. The Transport attached to the Medical Department will not be sufficient, and perhaps unavailable, for this duty, and the Auxiliary Transport must render all possible assistance.

ledge of the resources of the country around in all available means of transport, to be able at the shortest notice to gather them in and place them at the service of the army. An increase of transport may be necessary even in a country traversed by railways, consequent on a stoppage of traffic on the line through accident or the operations of the enemy, or by the line being reserved entirely for reinforcements of men, horses, or artillery. It will also be necessary to become acquainted with the roads parallel to the principal line of communication, and above all to ascertain which are the ones that have not been denuded of provisions and forage.

The obtaining of transport by contract or forced requisitions can be put into practice in European countries, or in our own territories in India; but in most of our wars elsewhere we have had to fall back on purchasing as the only means of raising a sufficient transport for our armies.

Our transport has generally been insufficient for our wants; hence we have had to resort to all kinds of makeshifts. In Continental armies, the military, or first line of transport, is always ready and prepared to cross the frontier with the troops; in most of our wars we have found ourselves at their commencement without even the vestige of one. Our preparations, generally speaking, lack the sufficient time required; officers are

sent to all the likely markets to purchase animals, but often the total amount required has not been obtained before the war comes abruptly to an end. As examples of this we have the Persian and the last China Wars, in both of which the war was over before the full complement of transport animals had been obtained, entailing a large expenditure to Government without the slightest return.

What length of time will be required to complete the necessary purchases of animals for the formation of a Transport Corps the property of Government for service in Europe? The late Colonel Clarke-Kennedy in 1867 purchased for the Abyssinian Expedition in the countries north of the Isthmus of Suez 8000 mules in between two and three months. With the same conditions and with the same markets open to us, we could purchase the number of animals sufficient for one Army Corps in about the same time, or even less, for it should be remembered that Colonel Clarke-Kennedy's purchases were confined to mules; had they been extended to horses, the amount of animals required would have been obtained in a shorter time. We might besides, also, purchase horses at home, and be able to enter into contracts for transport at the port of debarkation, which would materially reduce the time necessary for completing our Transport Corps. However, with the state of

readiness for war in which the armies on the Continent are at the present moment, to require two months, at least, to complete one's preparations, is to give one's opponent an enormous advantage.

Our wars differ materially from the wars of the Continent, and it will be a useful study to examine the course generally pursued in one of our usual expeditions in wild and uncivilized countries. We must not forget that these are generally wanting in good roads, poor with regard to supplies procurable, generally unhealthy at certain seasons of the year, of a difficult nature, and more or less unknown to us. These five drawbacks constitute the principal difficulties we have to contend with, and which make expeditions of this sort so arduous.

Our troops have to encounter wild tribes and people to whom war, strife, bloody feuds, and armed raids in search of plunder are, so to speak, the normal state of life. They have generally to follow enemies who, unencumbered by any impedimenta, acquainted with every track and path of the wild regions they inhabit, lightly equipped, independent of base of operations and line of communication, can move with rapidity, and whose small bodies of men, appearing at any moment in most unexpected places, in various quarters of the theatre of war, harass the troops, and baffle any course of action adopted by their

leaders. Moreover, every male capable of bearing arms takes part in the war. These men are all hardy, accustomed to fatigue and privations which they can well undergo, even on the scanty fare they can procure for themselves in their unproductive country.

To start with, a base of operations is selected; this can either be the port of debarkation, as Annesley Bay was in Abyssinia, or some well-advanced frontier station, as Cachar was for one of the columns in the Looshai expedition. To this base all the requirements of the army are either conveyed in transport ships or by land and river carriage. In short, this base becomes a huge magazine, in which a quantity of stores must be collected before the army can take a step forward, and through which pass all the supplies and stores which will be required during the entire period of the operations.

Here it seems worth remarking that the troops should be échelonedaway from this base, and only those actually required for the protection of stores, working and fatigue parties, should be sent there until a forward movement becomes possible, otherwise a portion of the stores accumulating would be rapidly consumed.

From the base commences the work of the Land Transport. The men, animals, carts, &c., are either conveyed or assembled here. If organized at the port of embarkation, they will be landed

here complete, and after the animals have had a rest the whole will be ready for work; otherwise the necessary organization must be taken in hand here before the actual work of the transport begins. To begin working a transport before it is thoroughly organized is to prepare for a failure which is sure to come sooner or later.

During a war or expedition it is difficult to organize, especially the transport, whose work commences the moment the troops disembark. If the Duke of Wellington did organize by degrees, as the Peninsular War went on, still that war lasted several years with long periods of inactivity. Our Land Transport Corps also in the Crimea acquired its organization whilst the troops were stationary before Sebastopol. We generally wait until an army actually takes the field, then organize the transport slowly and with difficulty.

In these expeditions the movements of the troops depend entirely on the efficiency of the transport arrangements, and the rapidity of their forward movements will keep pace with the establishment of magazines on the line of advance.

In many cases, such as in New Zealand, Abyssinia, and the Gold Coast, troops have had to make roads,* or at all events to improve the

* In the Bengal Army there are two regiments of Pioneers (the 23rd and 32nd). These are capital regiments for constructing and repairing roads, and would be very useful if employed on the line of communication.

existing ones, before a regular advance into the interior could be made. This, of course, delays considerably the operations, but it tends to strengthen the line of communication with the base, and will facilitate the forwarding of supplies during the progress of the expedition.

Generally speaking, the troops advance and retire, after the completion of their mission, by the same route; therefore provisions are required for the advance, the return, and for any stay that may become necessary either by the course the operations have taken, or that may have been actually foreseen. As regards the stations in the rear, there is generally no real difficulty as far as supplying the troops in the return journey; the main point is to clear the stations of all surplus stores as the army falls back. As the transport available increases as the troops approach the base, there is little difficulty in doing this; but such is not the case with reference to the stations in the front, where a large surplus flow of stores must come up to allow of the formation of magazines, at the same time that the army subsists on the stores that are brought up.

If what is brought up is consumed entirely by the troops, and required to feed the detachments écheloned on the line of communication as well, the formation of magazines or reserves becomes impossible. Here the officers commanding posts on the line of communication could play an

important *rôle* by obtaining what local supplies are procurable for the use of their detachments, without touching what comes from the rear for the advancing army; but in these countries the supplies to be procured locally are very few indeed, and, without a large overflow of all necessaries from the base, to form magazines on the line of advance is almost impossible.

The troops as they advance leave detachments of various strength to protect posts, patrol the line of communication, escort convoys, and perform other important duties.*

If the country is unhealthy, or if an obstinate resistance is met with, there will be a flow of men in the direction of the base to take into consideration. In staging operations the return carts will be available to clear the hospitals; the sick and wounded will only be men returning to the base earlier than the remainder of the army, and need not on that account call for extra arrangements to be made in the way of supplies; but on the point of escorts the matter is different, for the philanthropic tendencies of the day have not reached these wild regions. Where a simple badge or a modest flag saves the sick and wounded soldier in Europe, and calls for assistance from friends and foes alike, the helpless soldier is looked on by the wild people we have to encounter as their

* The number of men in front to feed will therefore decrease more and more as the troops near the objective.

prey, and the fate of an unguarded convoy of sick and wounded would be nothing short of massacre. Convoys of sick take a great deal of space, and demand a large number of men as escorts for their effective protection.

After a long and severe march, with periods of forced inactivity to enable the supplies to accumulate, the desired object of the expedition is attained either by the defeat of the enemy or by his coming to terms. In the first case he may remove into the interior, where he cannot be followed, as the operations would extend beyond any reasonable limit. In this case the retreat of our troops may be molested, particularly so if the enemy has not been discouraged by serious reverses. The magazines are removed as the army retires, and, if possible, the country is devastated, the enemy's villages and stores are burnt, and their cattle captured as punishment for their bad behaviour, and as the only means of preventing the recurrence of the same through fear of the loss it will entail on them in the way of retribution. This will also prevent the enemy following up and annoying the troops in retreat. In the second case the return of the army may be even facilitated by the assistance obtained from the former opponent.

The army either re-embarks or returns to the frontier station; the transport has completed the mission for which it was raised, there is no further

use for it, and it is broken up; the animals and stores are disposed of generally at a loss. It will seldom be of advantage to Government to sell the animals at the base itself; it would be in most cases more economical to disperse the transport amongst a certain number of stations before selling them, so as to be able to realize a fair price at the sale, which will never be obtained if the animals are sold at the base. With the transport goes all the experience gained by the officers and men: the traditions are not handed down from one to another: a fresh war breaks out, and a fresh transport is formed, and the experience dearly bought in one expedition is thus rendered unavailable for future use.

DISPOSITION OF THE TRANSPORT

OF AN ARMY UNDER THE VARIOUS EVENTUALITIES LIKELY TO ARISE DURING A CAMPAIGN.

The ancient Romans, fully recognizing what an obstacle to their military operations was the large train that usually followed their armies, gave it the very appropriate appellation of *impedimenta*.

It must be apparent to every one what confusion would reign in a column several miles in length of carriages of different descriptions, and pack animals of all sorts, where the want of well-defined regulations and the absence of the necessary supervision had failed to infuse order and regularity.

A proper organization of the whole Transport Train will do much in imparting order in this long moving mass of vehicles and animals. Hence it is that we commence by procuring good wagons, young and powerful animals to draw them, and strong, serviceable harness, to prevent any break-down on the way. We divide the whole into certain easily manageable fractions, to obtain more readily the supervision so much required. We mark every ambulance, wagon, carriage, &c., with the number of the division,

regiment, or branch of the service it belongs to, to help readily in recognizing to what part of the army the various fractions belong. These and such-like steps are taken before the troops actually go into the field, but this is not enough; there are other important considerations that have still to be taken into account, such as the position of the various parts on the line of march, the whereabouts of the same during the progress of an action, and the orders necessary regarding its movements under certain circumstances likely to arise on service.

As a general rule, the arrangements of the transport train on the line of march depend entirely on whether the army is likely to become engaged with the enemy or not. Some portions of the transport, such as the reserve ammunition, field hospitals, and ambulance wagons, will be required during the course of an action; these must therefore follow close in the rear of the army when an engagement is imminent. When no such probability exists, then the movements of the train will be made subservient to the convenience of the troops; but in all cases where an engagement is likely to ensue, the safety of the transport train, and the keeping clear of all the roads by which reinforcements may have to move up or troops retire, must be the principal points to attend to.

The Staff being well informed as to the state

of affairs, from the reports of the cavalry covering the front of the army, will be able to assign the proper place to each portion on the line of march. The orders will specify the various parts to accompany the troops, and the order in which they have to follow, the interval of time that must elapse before the other portions are to be put in motion, and how far they are to proceed; in some cases, as for example when an army is retiring, how long before the army moves off the transport train should leave camp.

The heavy portion of the provision columns, artillery parks, pontoon trains, &c., would seriously hamper the rapid movements of an army were they always to move with it; these should be separated from the troops, and move independently, somewhat in the rear. It can do no good, this portion of the train being always with the army, and it will suffice if it joins the main camp during the periods of halting.

An army may occupy a position in which it is desired to await an attack from the enemy. As the issue of the fight will be doubtful, and the troops may have to retire, one of the first precautions in such a case would be to get the baggage and transport train safely out of the way, and clear the ground and roads of all encumbrances. The train should be sent to the rear betimes, and need only be kept so far away that it can be easily brought up when required again. In this

and the following cases the reserve ammunition, field hospitals, and ambulance wagons must remain in the vicinity of the troops, as they may become necessary during the course of a battle.

An army may be in retreat, or such a movement may be contemplated on the approach of the enemy; the transport train in this case would also be moved to the rear, in such time as will allow of the roads being cleared for the columns to follow without loss of time. Should the retreat only be intended if the enemy displays superior forces, or shows a desire to bring on an engagement, and neither of these eventualities comes to pass, the train can be made to rejoin the troops late in the course of the day.

An army may advance to attack, or it is expected to fall in with the enemy on the march; the safety of the train, and the advantage of keeping the roads free of encumbrances, will in this case be best obtained by the transport train remaining parked in the last encamping ground, or at some place in the rear, ready to move forward when ordered to do so.

When two armies are fronting each other, one may receive large reinforcements, and attack when such a movement was least expected; in such a case the attacked would have to move forward to oppose the enemy, whilst the train is put rapidly in motion and removed from the field of battle. As a general rule, when armies are in

such vicinity to each other that an engagement is likely to be brought on at any moment, it will be always prudent to keep with the army only so much of the transport train as is indispensable, and this small portion can easily be withdrawn when it becomes necessary to do so.

When an army makes a flank march in the vicinity of the enemy, the transport train should conform to the movement by marching by some parallel road a few miles on the protected flank.

The ammunition reserves must follow the troops as closely as possible without coming under the enemy's fire, and should be placed in rear of the centre of their respective corps or divisions. The transport train has no business on the field of battle; there it will be uselessly exposed, and will be a hindrance if the army has to fall back or take up a position in rear. Its proper place is far in rear of the reserves, parked, and ready to follow the troops if they advance, or to precede them and clear their way if they retire. There should always be a small force detailed for its protection and the maintenance of order; for these purposes the baggage guards generally detailed and the military police should suffice. The field hospitals and the ambulance wagons must follow the troops; the first are halted in the places the medical officers select as most suitable for the reception of the wounded; the second must move still closer to the front,

and follow in rear of their respective corps, divisions, and brigades, ready to receive the wounded and convey them to the field hospitals.

With regard to the regimental reserve ammunition and entrenching tools, these should always march in rear of their respective regiments when an engagement is imminent. The regiments may be moved off the main road at any moment after coming in contact with the enemy, and in a wooded or difficult country the reserve ammunition and tools might never rejoin them if once separated. When there is no chance of an engagement they would do better in the rear, all in one group in front or rear of the baggage of each brigade.

In the detail of the Regimental Transport issued in August, 1875, the transport is arranged by companies and by squadrons, each company having a cart and each squadron a wagon in the first line, to carry the equipment and light baggage. This seems to show that it is intended that the company and squadron carts and wagons are always to be permitted to follow the troops closely, otherwise the men would be without camp kettles to cook with. Occasions may often occur where it is found necessary to have the minimum of baggage wagons with the troops; the distribution of equipment and light baggage by companies and squadrons in such cases would hardly be found to work well. It seems prefer-

able to have the camp kettles,* officers' mess things; regimental books, papers, &c., in one wagon, as these articles are always necessary, and cannot be left with the baggage in the rear without causing some inconvenience. The same with the maps, books, correspondence belonging to the general officers, and those of the Staff, which are always required after a march.

It should be a rule, strictly enforced, that no more horses or animals than are allowed by regulation are kept with the army, and that the animals and wagons are only used for the purposes for which they are intended.

The recent improvements in the arming of the troops and the increased care bestowed on the soldier have augmented the transport of armies. The use of breech-loaders has augmented the amount of ammunition to be carried in the field; with the new arms originated the use of shelter trenches, which demand that a supply of entrenching tools should be always kept with each regiment on service. The number of guns employed in the field has also increased, and with them the number and size of the ammuni-

* Some alteration in the pattern of the Flanders kettles now in use, which would permit of their occupying less space, would be a great improvement. The camp kettles used in India are very heavy, and require continual tinning; this adds considerably to the first cost, which is very high. Two mules or a camel are necessary for the conveyance of the cooking utensils of each company on the march.

tion reserves. The operations being more rapid than they were formerly, the infantry soldier cannot be overweighted, and in some cases his kit has to be carried for him. The relief and care taken of the wounded has likewise received, as it justly demanded, a great impulse; but with this the number of ambulances, carriages, and other means of conveyance for medicines, hospital comforts and appliances, have also augmented. Notwithstanding all this, the importance of continually studying how to diminish the train to render an army more moveable has not altered. It is an incontestable fact that the greater the wants of an army the less moveable it becomes; to bring a war, therefore, to a speedy and successful termination, an army must possess as much mobility as possible, and this can only be obtained by reducing its train as much as the efficiency of the army will permit.

If we examine the line of march of a division previous to an engagement, we shall find first the fighting portion, divided into advanced guard and main body, the small-arms ammunition wagons and tool carts in rear of their respective regiments. Then follow still further supplies of ammunition for artillery and infantry in the second line of artillery wagons and infantry and artillery reserves. This forms the fighting portion of the column. The wounded and the sick require attention next; hence the field hospitals and

ambulances follow in rear of the fighting men, after which comes the light baggage, comprising the articles actually indispensable for the maintenance of the men and animals for the day, and for the work which has to be carried out. The remainder of the Transport Train is devoted to the heavy portion of the impedimenta, the heavy baggage, provision columns, siege train, pontoon train, bakery and butchery columns, telegraph, post office, &c.; these must remain parked in rear until the result of the fight is ascertained.

On the other hand, when an army marching is only moving from one position to another, either with no enemy in front or with no chance of bringing on an engagement, the small-arms ammunition and tool carts and the ammunition reserves can be placed with safety further in rear, and the baggage, both light and heavy, provision columns, stores, &c., can be further advanced in the order of march, to permit of their coming into camp early in the day. The heavy portions of the train can best march at night, when, generally speaking, the roads will be clear of troops.

Intimately connected with the transport of an army are the officers detailed as Baggage Masters. These officers regulate the assembly and formation of the impedimenta in accordance with the orders they receive from the officers of the Quarter Master General's Department and are

responsible for its order, regularity, and discipline during the march. Baggage Masters have nothing directly to do with the efficiency of the means of transport, which is the principal duty of the Transport Officer, but they supervise on the march the entire train of their respective Army Corps, Division, or Brigades, and are specially appointed to guard against the conflicting interests which would be sure to arise if there was no supreme head to take the direction of its component parts.

The Baggage Masters should be active, intelligent, and strict in the execution of their duties, without which qualities they would be unable to enforce their authority on the class of men they would have to deal with, often not the most amenable to discipline.

One should be detailed for each Brigade, Division, and Army Corps, their army rank increasing with the importance of their charge, and, irrespective of seniority, their orders, as far as it regards the baggage, must be paramount.

The Staff Officers will issue their orders to the Baggage Masters regarding the place of rendezvous, the order of formation, the strength and composition of the baggage guard, the hour of starting, the road to follow, the destination of the baggage, and any other dispositions that according to circumstances may be necessary. In a Division, the Brigade Baggage Masters will take

their orders from the divisional, in an Army Corps, the divisional Baggage Masters will in the same way be under the direction of the Army Corps one.

Each Baggage Master should have a steady-mounted Non-commissioned Officer to assist him in his duties.

The Military Police are generally placed on the line of march with the baggage; any men committing themselves, or disobeying the orders of the Baggage Master, should be at once handed over to their custody, to be dealt with by the Provost Marshal. The Military Police, however, are with the baggage only to keep order, and in no way to form its escort.

The impedimenta in charge of Baggage Masters comprise all the wagons and pack animals that are attached to Brigades, Divisions, and Army Corps for the conveyance of the sick, baggage, provisions, and war material; all the carriage, in short, which does not find a place with the fighting portion of the column.

The baggage is generally formed up by brigades on their respective assembly grounds, and may be moved off to the divisional ground, if considered necessary, before being put in motion.

The usual order of march for the baggage of each Division is as follows:—

Baggage of Head Quarters of the Division.

Baggage of Divisional Cavalry Regiment.

Baggage of Head Quarters, 1st Brigade.

Baggage of 1st Brigade, in same order as Regiments in the Column.

Baggage of Head Quarters, 2nd Brigade.

Baggage of 2nd Brigade, in same order as Regiments in the Column.

Provision Columns.

Stores and *Matériel.*

Field Hospitals.

One or more companies of Infantry and a detachment of Military Police close up the rear.

On the march the Baggage Masters see that all the carriages and pack animals keep their proper place, that the drivers and men of the escort do not quit the column and do not molest the inhabitants, that no gaps are formed, and all breakdowns receive prompt assistance; in all of which duties they must be assisted by the Transport Officers. In short halts the baggage should remain in column, all drivers dismounting; in those of any length it may be parked to allow of the animals being unhooked and rested.

In crossing a bridge or defile or passing through a village or town, Baggage Masters must place sufficient guards for the maintenance of good order and the prevention of unnecessary halts.

On approaching the camp or bivouac it will be as well to make a short halt to get the baggage in perfect order, to remove any unauthorized animals or wagons from the column, and correct

any other irregularities; after which, according to the instructions the Baggage Masters have received, the baggage will be either parked or the several portions will be directed to move forward and rejoin their respective regiments, head-quarters, or departments.

At the conclusion of the march the Baggage Masters should report to their respective Staff Officers, giving an account of the march, with a statement of any irregularities that have been committed, reporting any arrests that have been made, and detailing any other occurrences which may have come under their observation.

CONVOYS,

PARKING WAGONS, AND FORMATIONS,

IN CASE OF ATTACK.

In column of route the wagons or carts follow each other in succession with an interval of four yards. The pace of all transport is the walk; the strictest attention should be paid to follow the rule of the road, and, except when the breadth of the roads will admit of it, or it is desirable to shorten the length of the column, no two carts should ever move abreast.

A convoy, or a division of the transport, is parked when the wagons or carts are all ranged in an orderly mass, generally in successive parallel lines, according to some established plan. The animals are unhooked, and are picketed, generally speaking, in the vicinity of the carriages they have to draw.

The most convenient manner of parking is to form up the lines of wagons at such a distance from one another as will permit of the animals being picketed in the intermediate spaces (Fig. 1). In this way the animals can be harnessed and put to in the shortest time.

The defence of convoys does not properly form

part of these studies, but their formation in cases of attack demands to be clearly understood. Convoys moving close in rear of an army, being generally protected by the position of the army in front, will seldom demand a special escort; a sufficient force to insure order and to attend to matters of police being all that will be required. When they are, however, moving exposed to an attack from the enemy, or through a disaffected country, they require an escort of sufficient strength, under charge of an officer of ability. Those composed of powder and ammunition require stronger escorts than those of provisions and stores, to keep the enemy further off the convoy during an attack.

The Officer Commanding the escort is entrusted with the charge of the convoy, and any officers marching with it, though of superior rank, have no right to interfere with his command. On the eve of departure all that is to form part of the convoy should be assembled and parked outside the town, fort, &c.; and a minute inspection should be made by the officer in charge to ascertain that everything in his charge is present; that the animals, harness, wagons, &c., are in good order; that a certain number of spare wheels, shafts, tools, and other articles to repair damages on the road, have been supplied; that no sick drivers or animals are present; if forage is to be carried, that it is there

and properly distributed; in short, that everything is in the best possible order.

On the march, where pack animals and wagons both form part of a convoy, the first should be placed in front. Generally speaking, the articles in a convoy will be placed in the following order: Ammunition, treasure, provisions, military stores, officers' baggage, suttlers' and merchants' carts. No unauthorized animals or carts can be permitted on any account to join a convoy.

Any carriage becoming disabled on the way must be drawn on one side and repaired; after the repairs have been exccuted it will take its place in the rear of the column. When a disabled wagon cannot be put in a fit state to proceed any further, it must be removed to one side to clear the road, and, if possible, should be replaced by one requisitioned from some village in the neighbourhood, otherwise the contents must be distributed amongst the lightest loaded of the other carriages; the horses being made over to the carriages most in want of them.

On the appearance of an enemy, greater attention must be paid to the drivers of requisitioned transport; for, serving, as they often do, against their will, they will try in the confusion of an attack to cut the horses' traces and save themselves, leaving the carriages without horses at the very time when the motion of the march should increase.

In cases where noise may point out to the enemy the whereabouts of a convoy, the drivers will be strictly forbidden to sing, or even to crack their whips. In countries where people are hostile, it will be always prudent to park a convoy far from inhabited localities; this should be the rule when the convoys contain ammunition or other combustible materials. The injunctions against smoking with these last should be frequently repeated and strictly enforced.

It will take about half an hour for about fifty carts to get into movement, so that in a large convoy the animals should be harnessed in succession. When the roads admit of it, two wagons can move abreast; to admit of this, the road must be broad enough to take three wagons besides the intervals of three feet between the axles of each two. This formation is assumed when it is desired to shorten the length of a convoy; but in crossing bridges and moving through villages this breadth will be found generally wanting, consequently there will be loss of time in resuming the single column. Still, where for a long space of time the double formation can be maintained, the advantage of shortening the length of the convoy should not be neglected.

A convoy, or division of transport, may be attacked on the march, in which case certain forma-

tions are necessary to ensure its safety, whilst the men entrusted with its protection repel the attack and drive back the assailants. Always on the enemy appearing in sight a careful examination should be made to ascertain if he is in a state of attacking with forces superior to the strength of the escort. The points every commander of a convoy must keep in view are to conduct the convoy entrusted to his charge safely to its destination, to avoid if he can an engagement with the enemy, and only to halt and park as a last extremity.* If the enemy is not strong, the march should not be delayed, but if he is in superior numbers and the march cannot be continued, it may be necessary to adopt one of the following formations.

The best formation to assume is that of a hollow square, the wagons and carts being ranged on the four sides, the interior space being occupied by the animals and drivers. In this formation, the wagons ranged axle to axle (Fig. 2) will form a very strong barrier; should the interior space be too limited, the wagons and carts may be ranged end to end (Fig. 3), a formation that will afford very much more room, though the barrier will not be so strong. On occasions there may be no convenient space at hand to form up in this order; then the wagons or carts should

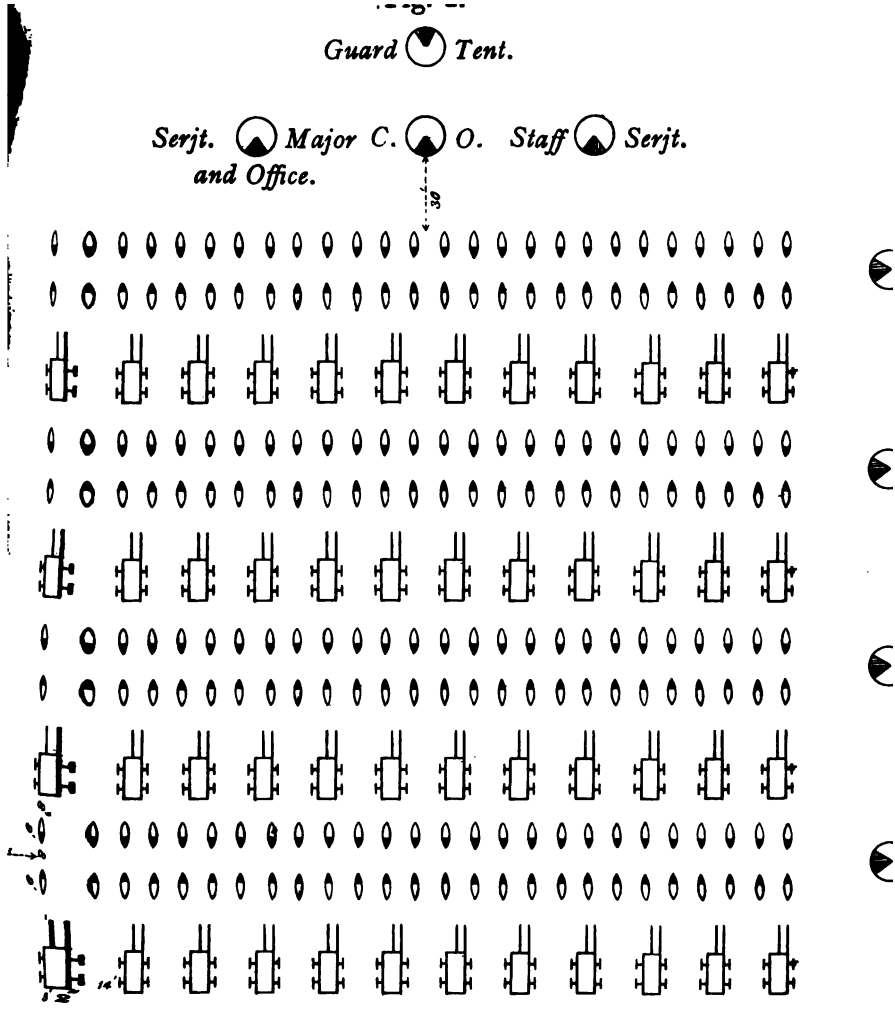
* It takes a long time to park wagons, and generally more than a strong enemy is inclined to give.

form in two lines end to end, and close up (Fig. 4), the animals being taken out and placed between the lines.

With two-wheeled carts, ranged axle to axle, the shafts should be turned towards the interior of the square. If they are ranged end to end, the shafts of each should be secured under the body of the cart in front of it. In both cases one or more openings must be left on each face to allow ingress and egress, but each opening should be secured by a wagon placed across it and a little in rear, to act as a traverse.

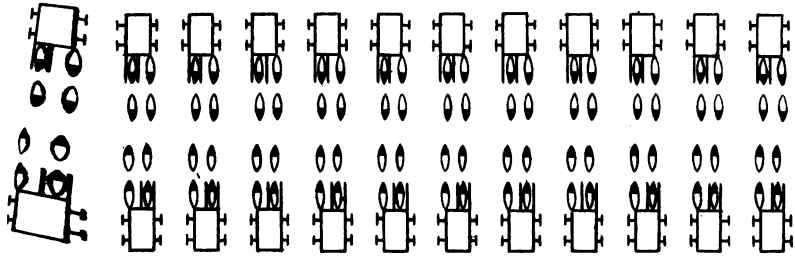
There will be great disorder in a convoy suddenly attacked by cavalry. The enemy's troopers will endeavour to cut the traces, and even hamstring the animals; it is therefore in such cases most necessary to attend first of all to the safety of the animals. The quickest and best disposition to take is to form a double line of carriages facing inwards (Fig. 6), a formation that will permit of the column of route being resumed in the shortest space of time.

All these formations in case of attack are, however, dangerous when the articles in the wagons and carts are powder or combustible stores; in this case, the best that can be done is to park the carriages in one mass (Fig. 5), and remove the animals and men to some place close by, where they will be safe in case of explosion, there to wait until the attack is repelled.



Division of 48 Wagons encamped.

Fig. 6.



Convoy attacked by Cavalry, quickest possible formation, two facing inwards, the column of route easily reformed.

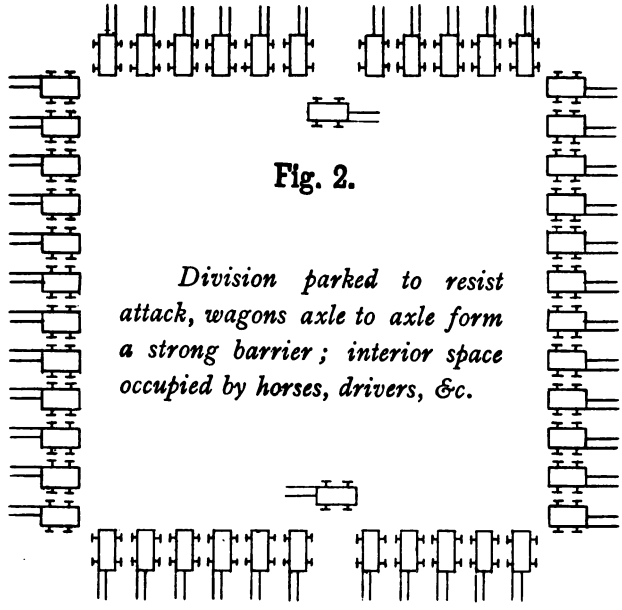
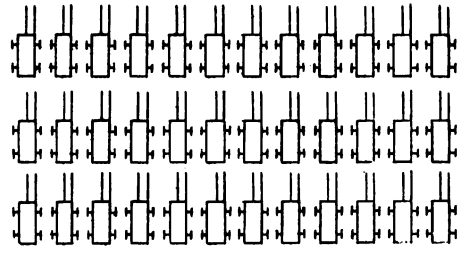


Fig. 2.

Division parked to resist attack, wagons axle to axle form a strong barrier; interior space occupied by horses, drivers, &c.

Fig. 5.



Division with powder or other combustible stores parked in mass, horses and men removed some way off during an attack.

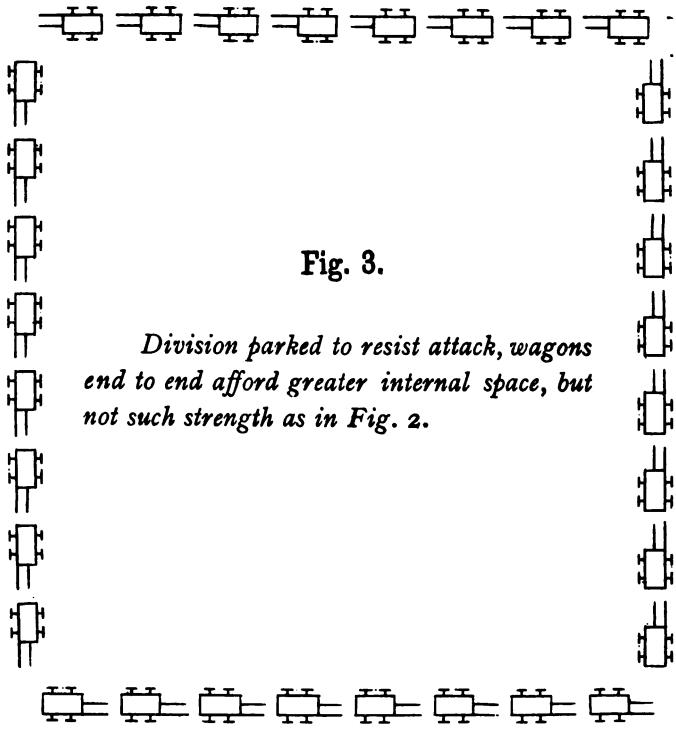
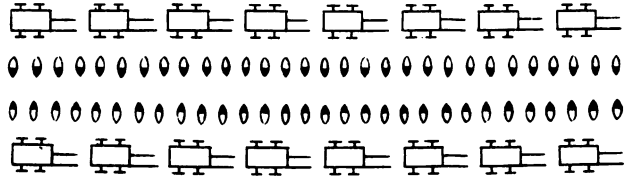


Fig. 3.

Division parked to resist attack, wagons end to end afford greater internal space, but not such strength as in Fig. 2.

Fig. 4.



No convenient place to park, convoy reduced by taking horses out, forming two ranks, and closing up.

As soon as the enemy is repelled the march should be resumed. This must be done with caution, as the enemy may wish to show he is retiring from an attack only to be able to renew it with advantage as soon as the convoy is again in motion. The best way of attacking a convoy is to take it by surprise, particularly in a defile; great care must therefore be observed when approaching one of these places, and parties from the escort should move forward and search the ground thoroughly.

Arriving towards the end of a march at a village or defile which will have to be crossed the following day, a convoy should always be encamped on the furthest side of these, for it is best to issue from these difficult places whilst the convoy is already moving onward in an orderly formation.

DUTIES OF TRANSPORT OFFICERS.

A new corps, like a transport corps, raised generally at short notice, will only in course of time perfect its organization and become thoroughly disciplined. This time is often wanting, for the operations may not extend over a few months; the corps therefore requires at starting a few clear rules for the guidance of its officers and men, to reduce as much as possible the confusion which is sure always to arise where officers and men are brought together to undertake duties to which they have not been accustomed.

The following might, in the absence of any others, form a basis to work upon, until a code according to the circumstances of the case is prepared.

Officers in charge of divisions are responsible for the entire efficiency of their divisions, with respect principally to the health of the men and cattle; rations and forage; serviceable state of harness, saddlery, wagons, and gear; discipline in camp and on the line of march; regularity of duties, and punctuality in the hours of departure.

When detailed for duty with the different departments of the army, the supervision of their

divisions is their special care. They must readily comply with the instructions they may receive from the officers of the department they are attached to, with regard to the stores, &c., they are to convey, and their destination. They must cultivate a cordial understanding with the officers of the different branches of the army, as petty jealousies and quarrels can only obstruct the smooth and efficient working of the various departments, so very essential on active service.

No animal should be worked immediately after disembarkation. Animals after a long sea-journey must be allowed to recover their strength gradually.

All animals for the Transport Corps should be branded—horses, mules, and ponies on the near fore arm, camels and bullocks on the near haunch —and a register should be kept by officers commanding divisions of all the animals, wagons, saddlery, gear, and other public property in their charge.

The saddle and harness should be separately fitted to each animal, and once fitted never changed. No animal with the slightest back or girth gall, or lame, should be used; all these should at once be turned over to the care of the farriers.

Sick men and animals should be sent, as soon as an opportunity offers, to the sick depôts; a roll showing when the man was last paid and

rationed, and articles of public property with men and animals, should be delivered to the depôt officers. Animals suffering from infectious diseases should be at once isolated.

Officers of the transport are answerable that nothing but the weight according to the scale established for each description of transport is carried, for which purpose they should be either furnished with scales and weights, or the weight of all loads and packages should be marked on them. The drivers should never be permitted to ride on the loaded animals, and no one should ride on the wagons but the persons duly authorized to do so. Proper care should be taken that the carriers and animals are never unreasonably overweighted or hurried on the march, as this will most likely seriously affect their carrying powers for the future. It should be borne in mind that, under excitement and urged by appeals of a higher nature, men can be got to double their exertions, but that this power does not extend to animals.

Commanders of divisions should report if the scale of loads, owing to insufficiency or inferior quality of forage, the length or difficult nature of the marches, or the nature of the country and climate, appears to be in excess of the power of the men and animals with due considerations to their future efficiency. Though bound to see that each animal carries or draws the load as laid

down in the scale, he should, with the written concurrence of the senior officer on the spot, reduce the loads if he has good grounds to believe that, owing to any particular circumstance, these are too great.

Officers of divisions must hold their subordinates responsible for the efficiency and good behaviour of their respective squads, and should ascertain by frequent inspections that the articles of equipment and gear are in serviceable order, and that all repairs are quickly and well executed.

The subordinates should inspect the girthing of saddles and harnessing of the horses before the animals leave the lines.

The officers and non-commissioned officers must pay particular attention to the line of march; carriers, pack animals, and wagons should move in an uninterrupted stream, with proper intervals but no gaps, conforming to the rule of the road. The senior officer will always march in rear of his charge, leaving the lead to be taken by the next senior. Animals that die in camp or on the line of march should be removed some distance from camp or from the main road, and, if possible, buried. Officers should report, at the end of each day's march, on the state of the roads they have marched over, pointing out where repairs are necessary. This is particularly necessary in staging operations.

Everything conducive to the health and com-

fort of the men and animals should be attended to. The officers should see that the men erect proper shelter for themselves; and, where there is abundance of material and the inclemency of the weather demands it, temporary stables should be erected for the animals.

The sooner the animals are fed and groomed after arrival in camp the better; if there are not sufficient men to unload wagons, &c., the carts should be parked and the animals taken out, and the unloading can take place afterwards. Saddles should not be removed until the expiration of an hour after arrival in camp, that the animals may get gradually cool.

An immediate report of any falling-off in the quantity or quality of the rations and forage should be made, and officers commanding divisions must inspect both rations and forage daily. When in the lines, the animals should be fed three times a day; viz., after morning stables, again at 12.30, and after evening stables at 6.30 p.m. On the march the hours of feeding must vary according to circumstances. The animals should eat their corn out of the nose bags, and not on the ground, as a good deal of grain will be wasted if proper attention is not paid to this. The animals should be watered in the early morning and again in the afternoon. Before starting for a march, however, little water should be given, and after arrival in camp an

hour must be allowed to elapse after feeding before they are watered.

A roll of the men should be called the first thing in the morning and the last at night.

Animals should be groomed before starting and after arrival in camp. This grooming need not be excessive, but such as will keep the animals in good health. Animals at rest should be exercised for the space of an hour daily.

As soon as practicable after the formation of a camp, latrines and refuse pits should be dug, and every attention paid to these sanitary measures. The men should also be made to parade often, to ascertain that they maintain themselves clean; this inspection should be often conducted by a medical officer, to detect disease.

No lines should be left at night without a stable picquet, with sufficient flying sentries, to look after the animals and the security of the public property. A small party should watch over the property in the lines when the division is out. All stable picquets should be provided with lanterns.

Rest after hard work is necessary both for men and animals; strict silence must be maintained in the lines during the night. The hours between which no noise of any kind is to be permitted must be fixed according to circumstances.

The officers must take great care that it is thoroughly explained to the men that looting,

pillaging, wanton destruction of property, &c., by camp followers cannot be tolerated. Any complaints against the men on this score must be immediately investigated, and if they are found correct the men should be delivered over to the Provost Marshal for punishment.

Officers should make themselves acquainted with the resources of the country in means of transport, so as to be able to supply any deficiency when necessary, or increase the carrying powers of their divisions when the necessities of the army demand it. If they can obtain means for feeding their men and animals in the vicinity of their stations, they should communicate the fact to the Commissariat Officers, with a view to a proper contract being made with the people of the place. They should pay the men themselves—weekly is most convenient—drawing the money from the paymaster, and forwarding a monthly pay-sheet showing all disbursements.

Particular attention at starting should be paid to the harnessing and loading. At every halt (one will take place every hour), and above all at the first, the animals should be re-girthed and have their feet looked at. Whoever leads must maintain always an even pace; the greater the length of the column the slower should be the pace at the head. Without this precaution, which is of great moment, the middle and, above all, the end of the column will experience sudden

checks and changes of paces, which if frequently repeated will greatly fatigue the animals. In a mixed convoy of pack animals and carriages the first should always be placed in front, as the carriages often cut up the roads.

During the progress of an engagement the drivers must remain with their divisions ready at a moment's notice to mount and move to the front or rear.

Greater attention and regularity on the march must be paid when the train comes up after a battle, on account of the confusion which always exists in rear of a great battle-field.

Officers in command of a convoy crossing a bridge, or passing through a defile, town, causeway, &c., should never halt their charges until these places have been cleared by the whole column. On arrival at a river or stream, the leader of a division of pack animals must halt and prevent any of the animals from drinking, as the march of an entire column will be delayed by even two or three animals stopping for that purpose.

Officers of divisions should keep a brief journal of the daily work performed, with any necessary remarks: * these journals may be called for at the

* They should report daily to the head-quarters of the transport how their divisions have been occupied, the wagons and animals available for duty, and any particulars that it is necessary the Director should be made acquainted with.

end of the campaign, to compile a summary of the labours of the corps, necessary for any future expedition.

The duties of Transport Officers and men on service are extremely arduous; it is not fair, therefore, that rewards should only fall to the more favoured ones who have the good luck to distinguish themselves before the enemy, whilst those by whose exertions and fatigues, unlightened by excitement, the army is brought face to face with him should remain unnoticed. Rewards should be given solely on account of work done towards the accomplishment of the object the General has in view. The exertions of men far in rear may have great influence on the result of the campaign, and Transport Officers on the whole length of the line of communication should be made to understand that their endeavours to forward the object of the General will be justly appreciated.

Transport Officers should strictly confine themselves to transport duties as long as they are attached to this branch of the service, and independent of their army rank must not assume command over any troops in any position whatever. It should be clearly understood that, setting aside the special duties each portion of the transport of the army is told off for, each officer and man is liable for any other duty that the General Commanding may at any time think fit to call him to perform.

ORGANIZATION.

Whatever organization is considered necessary for the transport of an army in the field, the whole detail must be fully prepared beforehand in time of peace. The Director, his staff, the officers and non-commissioned officers for the corps, should be about the first to proceed to the port of debarkation, to set going at once the organization approved by the authorities at home. Selected officers, with veterinary surgeons and accountants, should be despatched without loss of time to the most approved and convenient markets (which should have been previously ascertained), to purchase the animals required, all of which, after purchase, should be forwarded either direct to the port of debarkation for the army, or to depôts situated at a convenient distance from it.

As the transport will generally be a new corps, mostly composed of raw and untrained men and animals, it should be the first to be shipped to the port of debarkation, to give it more time to perfect its organization. It should not be lost sight of that its services will be the very first called for.

All articles of equipment which can be furnished by the arsenals at home should be shipped off at once, and no time should be lost in entering into

contracts for those articles which it will be deemed preferable to purchase locally.

In the field the Staff of the Transport should be with the army head-quarters; the Director, being under the orders of the Quarter Master General, will be able at all times to furnish him with reports showing how the various divisions of the transport are occupied, receiving through him the orders of the General Commanding with regard to the daily employment of the same.

When the Transport Staff leave the port of debarkation, a small depôt should remain to look after future supplies of animals, carriages, harness, &c., which may arrive to replace or reinforce the transport of the army.

A system of accounts, prepared beforehand, for purchasing-officers as well as for those in command of divisions, should be introduced from the very commencement of operations, to account for the correct expenditure of public money. The fewer books that are kept in the field the better, but some, as the following, cannot be dispensed with:—

Register of animals purchased.
Do. of equipment received and issued.
Roll of drivers engaged and discharged.
Casualty book.
Contract book.
Letter book.
Cash account book.

Any forms or returns required, such as pay abstracts, acquittance rolls, ration and forage indents, states, discharge certificates, should be issued to officers in printed forms, to obviate the necessity of having to write them out on service, which is at times a difficult matter and takes up a deal of time. *See App*

The staff proposed to work the transport of the army would be as follows :—

1 Director of Transport.
1 Assistant Director, with Officer in charge of the line of communication.
1 Transport Staff Officer.
1 Pay Master.
1 Quarter Master.
1 Veterinary Surgeon.
1 Interpreter (or more).
4 Clerks.
1 Pay Master Clerk.
1 Quarter Master ditto.
1 Farrier Major.
4 Orderlies.

A Veterinary Surgeon is considered necessary for every four hundred horses, and one Farrier and one Shoeing Smith for every fifty.

Transport, of whatever description, must be divided into regular portions, so that no more men, animals, wagons, &c., than can be effectively supervised by one officer, both in camp and on the line of march, may be allotted to each portion.

The established strength of the transport, ac- *See App*

cording to the Army Corps organization of 1875 is as follows :—

	Officers.	Non-Commissioned Officers and Men.	Artificers.	Drivers.	Wagons.	Carts.	Forge and Store Carts.	Spare Gun-carriages.	Ambulance.	Small-arms Ammunition Carts.	Horses.	Steam Ovens.	Baking Vans.	Bread Vans.	Butchery Wagons.
Regimental Transport for an Infantry Brigade*	3	...	...	72	15	27	...	...	...	9	144	...	...	...	...
,, ,, a Cavalry Brigade	...	...	...	66	30	...	3	...	...	...	132	...	...	...	...
Transport for a Field Hospital	...	...	...	12	6	...	...	...	...	...	24	...	...	...	...
,, an Infantry Brigade Ambulance†	...	...	...	27	...	...	...	...	27	...	54	...	...	...	...
,, a Cavalry Brigade Ambulance...	...	...	...	17	...	...	...	...	17	...	34	...	...	...	...
,, a Divisional Ambulance	...	...	...	22	...	...	...	...	22	...	44	...	...	...	...
,, an Army Corps Ambulance	..	...	...	23	...	...	...	...	23	...	46	...	...	...	...
,, an Infantry and Artillery reserve ammunition column	6	193	13	...	21	...	3	2	...	29	253	...	...	...	...
,, an Army Corps Ammunition reserve	18	477	32	...	90	...	9	6	...	...	649	...	...	...	...
,, a Bakery and Butchery train ...	2	176	...	94	5	5	...	...	...	...	201	3	14	14	5

* A small body of artificers attached to each brigade would perform all the necessary repairs for the regimental transport of the brigade, and might be as follows :—2 Farriers, 4 Shoeing Smiths, 2 Wheelers, 3 Collar-makers, 2 Carriage Smiths.

Tools will be required for the men, and material for repairs for three months.

† It has been ascertained by carefully compiled statistics in Germany, and from experience based on many wars, that the loss of men in a year's campaign amounts in Infantry to 40 per cent., Cavalry, Artillery, Engineers, 20 per cent., Military Train 12 per cent. From this it will be seen how the Infantry require at least double the number of ambulance wagons necessary for the other arms of the service.

Nothing regarding the composition or strength of the provision columns has been detailed with the above. In the German Army * each Army Corps has five provision convoys, each consisting of—

2 Officers.
1 Surgeon.
1 Pay Master.
89 Train Soldiers (2 Non-Commissioned Officers included).
1 Farrier.
1 Smith.

* In the Italian Army the transport for the troops is purely regimental; the Cavalry retain in peace time all the carriages and harness that will be required on service, but not so the Infantry, who receive theirs only when the army is mobilized. Both are supplied with draught horses by the committees charged to collect them in the various provinces of the State. The drivers are taken from the regiments.

Officers commanding Cavalry and Infantry Brigades are furnished with carts, drivers, and horses by the right regiment of their respective brigades; each regiment of Infantry of the line furnishes the reserve provision column of the Army Corps it belongs to with 1 corporal, 6 drivers, 3 soldiers, 6 battalion carts, and 12 draught horses, and each Rifle regiment with 1 corporal, 8 drivers, 4 soldiers, 8 battalion carts, and 16 draught horses.

The transport of the Head Quarters, Artillery parks (Division and Army Corps), hospitals, provision columns, bakery columns, and administrative corps is supplied by the Artillery Train, supplemented, if necessary, by a Civil Transport. The Engineer Train provides for all the wants of its own corps.

All the transport between the front of the army and the head-quarters of the various Army Corps is performed by the military train, in rear of this by railways, hired and requisitioned carriage.

2 Assistant Smiths.
1 Saddler.
1 Wheelwright.
1 Cooper.
30 4-horse Wagons.
1 do. Reserve.
1 6-horse Forge.
155 Horses.

*Appendix P. All the transport details shown in page 182 are calculated to meet the requirements of an expeditionary force sent on active service in Europe. A different organization becomes necessary when expeditions are undertaken in our far-away colonies, or in countries deficient of good roads. It would be useful therefore, to determine beforehand what convenient subdivision of the transport might be made applicable to most of these cases. The following divisions appear to possess ample superintendence and a regular gradation of responsibility, and are also of such strength as will secure their efficient working in most situations likely to arise on service in difficult countries.

DIVISIONS OF CARRIERS.

Strength of Division.	*Equipment required.*
1 Commander.	2 ponies and saddlery complete.
1 Staff Sergeant.*	317 suits of clothing.
	317 blankets.
	317 number labels.

* Doing the duties of Serjeant Major and Quarter Master Serjeant.

Strength.	*Equipment.*
3 Superintendents.	317 clasp knives and lanyards.
12 Mates.	1 spring weighing machine.
1 Apothecary.	1 set scales and weights for rations.
300 Carriers.	1 field companion.
2 Batmen.	4 lanterns.
Interpreters as needed.	15 sets arms and accoutrements for superintendents and mates.
	4 tents.

Carriers will generally have their own cooking utensils; if not, they must be provided with them. The men will also erect places of shelter out of the material to be obtained in the country.

As the Staff Sergeants and Apothecaries would join the Transport Corps fully equipped, they have not been taken into account with regard to clothing, equipment, &c., but a riding pony has been included for each Commander and Staff Sergeant.

DIVISIONS OF SICK-BEARERS.

Strength.	*Equipment.*
1 Commander.	2 ponies and saddlery complete.
1 Staff Sergeant.	48 hammocks, cots, or dhoolies.*
3 Superintendents.	48 sets shoulder pads.
12 Mates.	12 oil bottles.
2 Water Carriers.	319 suits of clothing.
300 Carriers.	319 blankets.
2 Batmen.	319 number labels.
Interpreters as needed.	319 clasp knives and lanyards.
	1 set scales & weights for rations.
	15 sets arms and accoutrements for superintendents and mates.
	2 water carriers' bags.
	4 tents.

* Each dhoolie should be provided with a water bottle, chagul, or other article to contain fresh water for the patient.

Six men are required for each hammock, dhoolie, or swinging cot; a division of the above strength will provide conveyance for 48 sick or wounded, demanding 288 carriers. This leaves 12 carriers for torches at night, and, as in hot climates much of the marching will be done by night, torchmen are indispensable. The men generally make their own torches, either out of rags or of some resinous description of wood; these 12 torchmen, marching by day, will be useful for carrying food for the remainder, or as extra reliefs, &c. No Apothecary is detailed for divisions of sick bearers, as they will be always attached to some field hospital, and medical aid will generally be at hand. The Medical Department should arrange for the medical officers, hospital orderlies, and cooks for the sick and wounded that may be necessary for each division.*

DIVISION OF PACK ANIMALS.

Pack horses, mules, ponies, bullocks, camels, or donkeys.

Strength.	*Equipment.*
1 Commander.	2 sets of saddlery complete.
1 Staff Sergeant.	214 pack saddles.
	214 saleetas.
3 Superintendents.	214 tarpaulins. 7′ × 6′ for horses, mules and ponies. 8′ × 6′ for camels.
12 Mates.	

* One Medical Officer is required for about forty sick or wounded; orderlies, nurses, cooks, &c., two per twenty men.

Strength.	*Equipment.*
1 Apothecary.	216 sets shoes and nails (except for camel divisions).
1 Farrier Major.	216 spare shoes.
1 Cattle Doctor (for bullocks or camels).	216 sets picketing ropes, &c.†
4 Shoeing Smiths.*	216 sets head gear, nose bags and grooming implements.
2 Saddlers.	216 nets forage.
1 Bugler.	216 sacks corn.
107 Drivers.	216 horse, mule, &c., covers.
2 Batmen.	133 sets clothing.
2 riding and	133 number labels.
214 pack animals (this includes 10 per cent. spare).	133 clasp knives and lanyards.
	107 whips (except for camels).
	15 hunting whips for N.-C. Officers.
	4 lanterns.
	1 set branding irons.
	1 farrier's chest.
	1 field companion.
	4 smiths' sets of tools.
	2 saddlers' do.
	8 buckets.
	17 kettles (unless drivers provide their own cooking utensils).
	1 bugle.
	Material for three months' repairs.
	Small supply of stationery and forms.
	1 set scales and weights for rations.

Of the animals, two horses are for the Commander and Staff Sergeant, and two pack animals to carry the farrier's chest, field companion, smiths' and saddlers' tools. Pack bullocks and donkeys do not require so many drivers as other animals. No shoeing smiths are required for

* Mules used as pack animals are, as a general rule, shod on the forefeet only, but when used in draught it is necessary to shoe all round. A shoeing smith can shoe about 100 mules per mensem.

† The equipment for elephants, mules, camels, and bullocks is detailed in the Indian Commissariat regulations.

camel divisions, and the camel and bullock drivers generally repair their own saddles. Two batmen are provided to look after the Commander's and Staff Sergeants' horses.

DIVISIONS OF WAGONS, CARTS, &c., DRAWN BY SIX HORSES OR MULES.

Strength.	*Equipment.*
1 Commander.	15 sets saddlery complete.
1 Staff Sergeant.	212 do. harness.
4 Superintendents.	32 wagons.
8 Mates.	227 sets picketing implements and gear.
1 Apothecary.	227 horse blankets and surcingles.
1 Farrier Major.	106 driving whips.
4 Shoeing Smiths.	12 hunting do.
4 Farriers.	1 lifting jack, spare linch-pins, and washers.
2 Saddlers, Collar-makers, &c.	136 sets of clothing.
2 Wheelers.	136 number labels.
4 Batmen and Orderlies.	136 blankets.
1 Bugler.	136 clasp knives and lanyards.
106 Drivers.	227 sets horse shoes and nails.
227 Horses or Mules (this includes 10 per cent. spare).	227 spare shoes.
	227 nets forage.
	227 sacks corn.
	20 breast straps.
	32 tarpaulins 10′ × 9′ if the wagons are uncovered.
	1 bugle.
	1 set branding irons.
	6 lanterns.
	1 field companion.
	1 farrier's chest.
	Shoeing smiths', saddlers', and wheelers' tools.
	Wheel grease and material for three months' repairs.
	17 camp kettles.
	32 buckets.
	14 tents.
	Supply of stationery and forms.
	1 set scales and weights for rations.

The apothecary, farrier major, shoeing smiths,

saddlers, collar-makers, and wheelers can be accommodated on the wagons, their chests and tools being carried in the limber boxes. In staging operations, only the artificers required for hasty repairs on the road will accompany the divisions.

A lantern should always be with the leading wagon of each division, the others divided amongst the rest. Lanterns are indispensable at night to execute repairs and readjust loads. Tents are calculated at 1 for Commander, 1 for Staff Sergeant and Office, 1 for Apothecary, 1 for quarter and 1 for rear guard, 9 for the rank and file.

DIVISIONS OF WAGONS AND CARTS DRAWN BY FOUR HORSES, MULES, OR BULLOCKS.*

Strength.	*Equipment.*
1 Commander.	15 sets saddlery complete.
1 Staff Sergeant.	212 sets harness, or 106 yokes for bullocks.
4 Superintendents.	48 wagons or carts.
8 Mates.	227 sets picketing implements and gear, or picketing ropes and posts for mules and bullocks.
1 Apothecary.	227 nets forage.
1 Farrier Major or Cattle Doctor for bullocks.	227 sacks corn.
4 Shoeing Smiths.	227 horse blankets or covers.
4 Farriers.	106 driving whips.
2 Saddlers, Collar-makers, &c.	12 hunting whips.
	136 sets uniform.
	136 number labels.
	136 blankets.
	136 clasp knives and lanyards.
	227 sets shoes and nails.
	227 spare shoes.
	20 breast straps for horses or mules.
	6 lanterns.

* A cart with four bullocks will carry a weight of 1600 lbs.; one with two bullocks, of 800 lbs.

Strength.	*Equipment.*
2 Wheelers.	17 camp kettles.
4 Batmen and Orderlies.	14 tents.
1 Bugler.	48 ropes and tarpaulins 10′ × 9′, for uncovered carts only.
227 Horses, or	1 set branding irons.
212 Mules or Bullocks, and	1 set scales and weights for rations.
15 Horses.	1 field companion.
106 Drivers.	1 farrier's chest.
	Shoeing smiths', farriers', saddlers', and wheelers' tools, wheel grease, and material for three months' repairs.
	Stationery and forms.
	1 bugle.
	48 buckets.

DIVISIONS OF WAGONS, CARTS, &C., DRAWN BY TWO HORSES, MULES, OR BULLOCKS.

Strength.	*Equipment.*
1 Commander.	15 sets saddlery.
1 Staff Sergeant.	212 do. harness, or 106 yokes for bullocks.
4 Superintendents.	96 wagons or carts.
8 Mates.	96 ropes and tarpaulins 10′ × 9′, for uncovered carts only.
1 Apothecary.	227 sets picketing implements and gear, or picket ropes and posts, for mules and bullocks.
1 Farrier Major or Cattle Doctor.	227 nets forage.
4 Shoeing Smiths.	227 sacks corn.
4 Farriers.	227 horse blankets or covers.
2 Saddlers, Collar-makers, &c., except for bullocks.	106 driving whips.
	12 hunting do.
	136 sets uniform or clothing.
	136 number labels.
	136 blankets.
	136 clasp knives and lanyards.
2 Wheelers.	227 sets shoes and nails.
4 Batmen and Orderlies.	227 spare shoes.
	20 breast straps for horses or mules.
	6 lanterns.
	17 camp kettles.
	14 tents.
	1 bugle.

Strength.	*Equipment.*
1 Bugler.	96 buckets.
106 Drivers.	1 field companion.
15 Riding animals.	1 farrier's chest.
212 Draught animals.	1 set branding irons.
	1 set scales & weights for rations
	Shoeing smiths', farriers', saddlers', & wheelers' tools.
	Wheel grease and material for three months' repairs.

Divisions of elephants depend upon the number of these animals available for service; divisions of horses, mules, and bullocks for drawing wagons or carts by the staging system of relays depend upon the number of carts available, and can conveniently be formed according to one of the above cadres.

Depôts for the sick animals of the transport require to be formed and placed at convenient distances along the line of communication; the following establishment would be generally sufficient for the efficient working of each depôt:—

1 Officer in charge.
1 Staff Sergeant.
2 Superintendents.
1 Veterinary Surgeon.
1 Farrier Major.
2 Shoeing Smiths. 50 Men.

As the wear and tear of the transport material will be considerable in the course of a campaign, the formation of parks for the repairs of carriages, harness, saddlery, gear, &c., becomes necessary. These parks have charge of repairing and main-

taining the carriages and equipment of the Military Transport in efficient order, by executing all the larger repairs to which the artificers attached to the various divisions of the Transport Corps cannot attend.

Each Army Corps should have its own repairing park, besides which one of larger dimensions should be established in rear of the army, in some suitable place on the principal line of operations. This reserve park is stationary, and, being in communication with the army and the base, receives and forwards, according as it becomes necessary, the reserves of all material required for repairs by Army Corps parks and division artificers. It attends to all the repairs which cannot be done by the parks moving with the army, and, in urgent cases, it even undertakes any new constructions which may become necessary.

The following establishment for an Army Corps repairing park would be sufficient for all requirements:—

1 Officer in charge.
1 Staff Sergeant.
1 Superintendent of Works.
1 Clerk.

30 Artificers:
- Blacksmiths.
- Carpenters.
- Saddlers.
- Rope-makers.
- Wheelers.
- Painters.

2 Forge carts.

4 Wagons ..... To convey iron, wood, leather, cloth, rope, and other material for repair.

24 Horses.
12 Drivers.

The reserve park demands a larger number of artificers, and can draw for these on the resources of the country with advantage.

The strength of the various divisions here proposed is not large, and one officer assisted by his subordinates should be sufficient to exercise such supervision as would ensure the thorough efficiency of his division. 'Lord Napier, in his correspondence on the transport for the Looshai Expedition, recommends ample superintendence, with a regular gradation of responsibility, their absence having invariably resulted in a certain degree of failure.

A properly organized transport renders the line of march more regular; the drivers or carriers, being well overlooked, readily obey orders and conform to the instructions they receive; the better disciplined the men, the more orderly will the march be. The drivers, regularly paid and fed, serve cheerfully, and the desertions will be few. They will get also confidence in each other, and will conduct themselves well under trying cir-

cumstances. The hostility of the inhabitants, often caused by the bad behaviour towards them of camp followers and drivers of baggage animals, will be in great part reduced.

Dress or Clothing.

Everything that tends to make order out of chaos must be of advantage in military organization; hence dressing the drivers or carriers all alike (at all events, those belonging to the first line of transport, to show to what branch of the service they belong), must be of undoubted advantage. The extra expense will amply repay itself by the men being kept in good health and spirits, besides which a man in a known dress is not likely to misconduct himself, for fear of being easily detected.

It is a difficult matter to propose anything regarding the best dress for transport men; but, whatever dress is adopted, it should always be suitable to the climate and season in which the men have to work. Transport men are constantly obliged to assist personally in loading and unloading wagons, have to alter loads, adjust harness, put on and take off the drag, &c., and their dress should be such as not to hinder them in the performance of these duties. A blue or drab-coloured frock, of some good wearing material, suited to the climate, would undoubtedly answer well in most cases. For men of Eastern climates there is no better head-dress

than a turban; and for the others a broad-brimmed hat, something like that worn by the Italian Bersaglieri, with a double chamber for tropical climates, would be at the same time a most useful and becoming head-dress.

In the Duffla Expedition the carriers were served out with blanket coats and trowsers, and nothing better could have been issued for the country they were called to work in. For carriers in India, sandals, or *chupplies*, with cloth bandages to wind round the leg, are very useful.

The drivers should be furnished with good boots or shoes; this point demands attention, and it will be found that boots from home will be the best and the most economical to issue. Long boots are difficult to put on when wet, and uncomfortable to walk in; ankle boots and gaiters (with hooks and laces, not with buttons) are preferable for men who have to ride.

Each man should be in possession of a good clasp knife, to be worn with a lanyard round the neck, sailor-fashion. The long cavalry sabre issued to the drivers of the Army Service Corps always gets in the men's way, and the same objection to it has been raised by officers of Continental armies; where the men are to be armed, a good revolver will be found the best weapon to issue for all purposes. If a sword is thought

indispensable, it should be a short one in a wooden scabbard.

The transport men, if dressed at all, should be dressed neatly and serviceably, but they are engaged for work, and for work in all weathers, and anything about their dress which will demand a deal of cleaning and furbishing should be avoided.

If the service is to be in cold and wet countries, a great-coat of some description must be issued. A good Scotch plaid of rough material would perhaps answer better than a great-coat. It can be worn in a variety of ways, and if wound round the chest and back it will be a good protection against both cold and rain, whilst the driver's arms are left free for use. It is easily spread out to dry, it rolls up in a small compass, and can be used in place of a second blanket.

In cases in which clothing the Transport Corps men is considered inopportune, they should notwithstanding be provided with metal labels, showing the corps or the department they are temporarily attached to, and their own number, as well as that of the Transport Division to which they belong. When there is time, it will be found a better plan to stitch cloth numbers to the clothing itself, for metal labels can be torn off or lost.

It will materially help in keeping the accounts if each driver is provided with a small book or card, on which all particulars connected with his

engagement, pay, promotion, reduction, issues of clothing, &c., are entered by the officer in charge of the division he belongs to.

Rations.

Transport men have to endure a good deal of fatigue, and it is only right that they should be regularly and well fed. It is impossible to fix a scale of rations, as much depends on the country and the habits of the people employed. Tobacco and opium,* in countries where these luxuries are not to be purchased, should be procured for the men, as those who are accustomed to indulge in them regularly will feel greatly the want of them on service.

Many desertions amongst the carriers in the war on the Gold Coast were caused by the non-issue of rations. Very true that the carriers received a money allowance in lieu thereof, but the country had been devastated by the enemy, and there was no food to be obtained. Amongst the Engineer labourers, to whom rations were regularly issued, there were fewer desertions than amongst the other men. When rice, towards the close of the war, was issued to most of the carriers, the non-issue of salt was the cause of a good many cases of diarrhœa.

* The privation of the drug, instead of invigorating the men and fitting them for work, would in most cases have the contrary effect: the habitual smokers would have pined away, and eventually died. (Swinhoe's *North China Campaign of* 1860.)

Pay.

The scale of pay should be liberal, to induce a good set of men to engage. The men should be paid regularly (once a week is most convenient), and the payments should be made by the officers. The less subordinates, particularly native, have to do with money the better.

Shelter Huts.

Shelter for men in cold, rainy, and unhealthy climates is a necessity. The difference of temperature between the day and the night in most tropical countries is very marked, and is one of the principal sources of disease. Natives of most wild countries are very clever in constructing sheds, or lean-to huts, for shelter, and these answer very well when no tents are issued.

The Ashantee warriors and carriers constructed in their camps small lean-to huts, each capable of sheltering two or three men. These consisted of light frames of sticks inclined at an angle of 45°; over these were spread leaves of plantains, which in that country grow very plentifully and large. Often in their camps were also found small bedsteads, likewise made of sticks bound together, raised some five or six inches from the ground—a very easy arrangement, and a very desirable one, too, in a swampy and pestilential country like Ashantee, where there was any amount of material at hand.

All cleanliness is conducive to health, particu-

larly where there are large gatherings of men. All conservancy arrangements require to be carefully supervised by the officers and non-commissioned officers, the men being made to parade when opportunities occur, to show they keep themselves clean.

Enlistment.

It should be borne in mind that, however it may be intended to expand the present home transport in case of war, it has always been found difficult enough for England to obtain recruits for the combatant ranks, so much so that foreigners have been enlisted in large numbers in her army in the last two European wars she has been engaged in. A large portion of our transport will always be manned by foreigners, recruited from the countries in the neighbourhood of the seat of war, and experience goes to show that these men require to be kept under strict discipline. A mixture of our home transport with the foreign element will be found to answer, if the latter are regularly enlisted, and by the terms of their engagement complete control can be obtained over them.

Experience has shown that this foreign element is often a source of weakness; if we could dispense with it, the efficiency of the transport would be more secure.

The drivers should be engaged to serve for a stated period, according to what the length of the

campaign is expected to be, with the understanding that should it be protracted longer their engagement must continue until their services can be dispensed with.

At the time of enlistment the men should receive full information regarding their terms of engagement, their pay, rations, clothing, pay remittances to their families, return passage home, rewards, promotions, and punishments. Full information regarding these points and the extent of their duties, once given, will save a deal of trouble for the future.

The military organization of the first line of transport is a necessity, but it should not be carried too far; the main objects to obtain are to accustom the men to obey readily the orders they receive from their superiors; to habituate them to move in large masses with order and regularity, and to obtain a cheerful performance of their duties both in camp and on the line of march. To impart military precision to all their movements, and to deprive them of that elasticity which is so necessary to a Transport Corps, would be a fatal error.

Drill.

A certain amount of drill will be necessary both on foot and mounted, but it should be restricted to the most simple and necessary movements. For the first, such as will be necessary for inspecting the men and marching them regularly

to and from the lines, saluting, sentry, and picquet duty; for the second, mounting and dismounting, taking ground to a flank, forming to the front, flanks, and rear, advancing and retiring in line and from a flank, and forming double column on the march. All these movements are easily picked up in a few days by most men; any further it would be unnecessary to go.

The reports of the unhealthy climate of some countries will have a marked effect on the recruiting of drivers, and it might be therefore at times necessary to offer some kind of gratuity to men invalided from the effects of the climate, which, in case of the man's death, might be passed over to his family.

Every officer acquainted with our military history cannot fail to have remarked the continual recurrence of our small wars and expeditions; these demand a special education for our officers, and an organization suitable for small armies serving principally in uncivilized countries. In these the transport becomes a point demanding particular attention, for we must bear in mind that in most of these expeditions we move the best fed and cared-for troops in Europe in countries far from home, in trying climates, over bad roads, and across unproductive districts.

It is our duty to prepare all the details for the

mobilization of our home army; it shows a state of readiness which will go far to reassure the country, and will do much to allay those constantly-recurring alarms of invasion which from time to time disturb the minds of our people. It is doubtful, however, if we shall ever be in a position to place a large army in the field in Europe; for what would be the use of sending abroad one Army Corps, when foreign armies have in our days hundreds of thousands of men always ready to commence hostilities with? In the Napoleonic wars, when our gold kept large armies in the field all through the Continent of Europe, we could not raise enough men in our own country to fight in the Peninsula and in Belgium, and the armies led by the Duke of Wellington were full of foreign mercenaries. With the obligations towards general military service which is the law of all nations on the Continent of Europe, it will be more difficult for England to obtain foreign mercenaries now than it was in her former wars, if not even impossible. Setting aside the unaggressive spirit of our people, and the opposition towards engaging in a war, however righteous the cause may be, we have not enough of troops to engage single-handed in a continental war. Our best authorities have repeatedly expressed their opinion that to raise a numerous army in England some system of conscription is absolutely necessary; but from

the introduction of this we seem to be as far as ever we were.

For the small wars and military expeditions in which we find ourselves continually engaged is required a special organization—a well-prepared system which will admit of our working, in a certain way, independently of assistance from home, making the most of all material we find ready at hand. This part of our organization has not as yet received the attention it deserves; all our efforts have been lately directed towards preparing for any possible contingency that may lead us into war in Europe, but our expeditions in far-away uncivilized countries, which are a reality and of frequent occurrence, have not as yet been taken into consideration.

The Transport Corps at present serving entirely at home loses many opportunities of useful instruction abroad. What, it may be asked, is the advantage of keeping a Transport Corps at home when we see part of it sent out to New Zealand only towards the end of the war; not sent at all to Abyssinia, though the transport there was one of the principal difficulties of the expedition? And was not on the Gold Coast the raising of a Transport Corps entrusted to a Supply, and not to a Transport, Officer of the Control Department?

The subject of Military Transport, particularly for us, is of immense importance, and there is no doubt that it requires to be entrusted to the care

of some officer of experience, who should devote his entire attention to it.

This officer should become acquainted with the principal markets where animals can be obtained; with the best contractors for saddlery, harness, &c.; with the time required for various contracts to be fulfilled, and the cost of the various articles. He should study the system of Military Transport of foreign armies, and propose for adoption all the improvements in wagons, ambulances, and equipment that possess particular points of recommendation in their favour. He should prepare schemes for transport arrangements suited to various countries, based on our former experiences; and to him should all reports of future transport operations be sent, so that all that recommends itself as good may be adopted in future cases, and all that is bad be eliminated. He should have lists of officers, good judges of horses and accustomed to the management of animals, to send abroad to make the purchases required on the formation of a corps; and should also have rolls of officers who have served in this branch, and are capable of serving in it again when the necessity arrives.

With an officer entrusted with the study of all that concerns Army Transport in time of peace, it would be a small matter not keeping up a large corps, which would be, no doubt, a great expense to the State. Everything would be fore-

thought and prepared, and on the outbreak of a war or expedition this branch of the service would be conducted by an officer of experience, and not, as often occurs now, by a totally untried and inexperienced officer.

The officering of the Transport Corps should not present any great difficulty. All regiments, corps, and departments should be complete in officers on service, and it is not advocated to remove any officers from these. In our army it will not be a difficult matter to obtain volunteers from the half-pay list, from regiments and corps not called to take part in the war, and from officers on furlough from the Indian Army. A roll of officers ready to come forward for this service, when called upon, might be prepared beforehand by the officer in charge of the department, who would, after ascertaining the qualifications of each separate officer, be able to make a good selection.

With all the requirements of an army on transport matters carefully studied in time of peace, with everything prepared beforehand, and nothing left to chance, it is naturally presumed that an efficient transport for our army could be set on foot in a very brief space of time, and with a good deal of saving of public money.

It should be the business of every department of the army to study attentively in time of peace all that would have to be attended to on the

outbreak of a war, to prepare carefully-detailed plans of the various operations which would have to be carried out, arranging for everything in such a way as to ensure that, at whatever moment the order to place an army on a war footing may arrive, the work will be carried out effectively and in the shortest space of time.

The question has been raised abroad of having one Transport Train to supply horses and drivers for the entire army, embracing the Artillery, Engineers, &c.; and this system has been adopted in the Italian army, but there are very serious objections against the system, and the advantages advocated are not of sufficient importance. Even in the Italian army the adoption of this system has been strongly opposed and severely criticised.

[*The following alterations and Addenda having been received from the author after the work as originally sent had been struck off, are here given as an Appendix.*]

A (p. 17).

A civil transport train can, however, render important services when employed far in rear of the field army, as long as the men employed run no risk from the enemy's fire, and are not removed from the neighbourhood of their homes.

B (p. 27).

M. Baratier, *sous-intendant militaire*, in a small pamphlet, "La Verité sur l'Unification des differents Services de Transport," shows how this very question is understood in the French service. He says: "The decrees of organization of the 29th February, 1852, and of the 11th June, 1853, make a distinction in the service of the transport train between command and employment. With regard to command, the transport train has its personal independent existence like every other corps of the army. The administration has nothing to say to the organization of these troops, the police, interior discipline, punishments, rewards, changes of *personnel*, any more than to offer advice regarding the management of the carriages or the park. Thus, under this head, the transport train is legally constituted as a really autonomous corps, depending essentially upon its own command, and having no further relation with the *intendance* than on the point of view of its interior administration; the same as all the other corps of the army." After showing the difference between the normal and the exceptional service of

the corps, he adds: "The officers of the *intendance* have repressive authority over the *personnel* of the train, but only for the execution of the normal service and whilst this service lasts." Further on he concludes: "Thus, to resume, in giving the word, to command all the acceptation which is generally attributed to it in military parlance, it is correct to say that the *intendance militaire* does not command the transport train; that she only makes use of it, and that her authority is limited to the employment of the means of action possessed by that arm."

C (p. 35).

The Infantry and Artillery ammunition reserves on a battle-field participate, though in a limited way, in the action of Artillery, therefore a close intimacy between the Artillery and the ammunition reserves will be of advantage. This can be obtained by organizing its transport from the Artillery itself.

D (p. 41).

The twelve transport companies of the Army Service Corps are distributed for duty between the stations of Woolwich, Chatham, Portsmouth, the Curragh, and Aldershot; the strength of each is 133 officers, non-commissioned officers, rank and file, with 91 horses. The twelve companies, therefore, represent a total strength of 1596 officers, non-commissioned officers, and rank and file, and 1092 horses.

The war establishment and organization of the transport companies Army Service Corps have undergone a marked change by the issue of the tables which accompanied the Army Circulars of the 1st December, 1877.

To the existing establishment of each company will be added for service 13 of all ranks, with 6 riding horses, which will bring up its cadre to 146 of all ranks, with 18 riding and 79 draught horses. These numbers, however, do not

in the least represent the strength of the companies on service, as the drivers and draught horses are to be added to the cadres in whatever number it may be deemed necessary, from reserves or local means; so much so, that for the 8 companies required for an Army Corps in the field, the totals are 1795 of all ranks, with 144 riding and 2746 draught horses, demanding an increase over the peace establishment of 731 of all ranks, with 48 riding and 2114 draught horses. This will be better explained by the following table:—

Officers and Men.	Riding Horses.	Draught Horses.	
1064	96	632	Strength of 8 companies at the present establishment.
104	48	...	Required to bring the cadres of 8 companies to war establishment.
627	...	2114	Required to complete the numbers necessary for an Army Corps in the field.
1795	144	2746	Total strength of 8 companies with an Army Corps in the field.

The strength of the present establishment, already given as 1596 officers and men, with 1092 horses, would be raised in war time to 1752 officers and men, with 1164 horses; these figures would then only represent the cadres of the 12 companies, the additional drivers and horses will greatly depend on circumstances.

The correct principle in the matter of transport is to give such an organization to the nucleus which, for just reasons of economy, is maintained at the lowest possible figure in peace time, as will enable it to assume its proper proportions rapidly on the outbreak of a war. The division of the various companies each into four sections for particular duties has been a great step in advance in the organization of the home transport.

The sections are to be used detached, under the command of an officer; but the strength of each one in drivers and

horses will vary according as it is attached to a different part of the Army Corps. For an Army Corps eight companies are required, four for the 1st and four for the 2nd line. The organization tables show at a glance what duty each section is to be detailed for, and the number of men, horses, and carriages required, not only to complete it to its war establishment, but to enable it to carry out efficiently the duties it will have to perform. An examination of these tables will convey the best idea of the working of the new system, and they are on that account embodied in these studies.

With some sections of the Army Service Corps Transport will be incorporated officers and non-commissioned officers of the medical department and Army Hospital Corps, and a certain number of bearers, to assist the wounded and remove them from the field of battle to the field hospitals. These form the bearer companies, to each of which will be attached 10 ambulance wagons and 23 spring carts, which last will be taken with drivers and horses from local sources, when available. For mountain warfare these bearer companies will approach very close to the *compagnies légères* of the French service, each company having 50 muleteers and 100 mules, cacolets and litters replacing the ambulance wagons and spring carts. Of the 100 mules, only 76 are for the conveyance of the sick and wounded; the remaining 24 are for equipment, water bags, appliances, &c. (See Tables annexed.)

E (p. 82).

In Turkish Arabia, the camels, horses, and buffaloes are of superior quality. The horses are numerous, and of the best Arab blood. The mules from the district between the Tigris and the Persian frontier, and the asses of Bagdad, are famous. In Anatolia the best breed of camels is a cross between the Bactrian and the Arab camel. The Arab camels from Mesopotamia cost £7 or £8 each. Strong thick-set horses cost from £3 to £7, a pair of oxen £6, a pair of buffaloes £8 to £13. Smyrna is the chief port of Anatolia.

ARMY SERVICE CORPS.

TRANSPORT COMPANY.

The Company of Transport is calculated and organized on a footing that will, by the addition of certain details on taking the field (enumerated below in block type), permit of its being used with sections detached.

The War Establishment of Drivers and Horses will vary with the portion of an Army-Corps to which the Sections are attached.

I. Company.—When a Company is attached to a Division it will be thus divided—

(*a*) Hd.-Qrs. and No. 1 Section will supply the Departmental Transport of the **1st Line** of Divisional Details.

(*b*) 2nd Section to the Bearer Company, when so attached, the Serjeant is not promoted, and the Corporal and Trumpeter are not added to the cadre, but a riding horse is added, and given to a N.-C. Officer.

(*c*) 3rd and 4th Sections to 1st and 2nd Infantry Brigades respectively.

II. and III. Companies. To **1st Line** of 2nd and 3rd Divisions.

IV. Company.—(*a*) Head-Quarters and 1st and 3rd Sections will supply the Departmental Transport for **1st Line** of Corps Details, including ½ Bearer Company, and No. 2 Section of this Company will be Reserve.

(*b*) 4th Section to Cavalry Brigade, including ½ Bearer Company.

Four more Companies will be required to supply the Departmental Transport of the **2nd Line**, of Divisions, and Corps Details and Reserves, as shown in detailed Tables for an Army-Corps.

N.B.—Transport for Regimental Purposes is not included in the above.

Officers and Men.	Hd. Quarters & 1st Section. War Establishment. Number.—All Ranks.	Hd. Quarters & 1st Section. War Establishment. Horses. Riding.	Hd. Quarters & 1st Section. War Establishment. Horses. Draught.	2nd Section. War Establishment. Number.—All Ranks.	2nd Section. War Establishment. Horses. Riding.	2nd Section. War Establishment. Horses. Draught.	3rd Section. War Establishment. Number.—All Ranks.	3rd Section. War Establishment. Horses. Riding.	3rd Section. War Establishment. Horses. Draught.	4th Section. War Establishment. Number.—All Ranks.	4th Section. War Establishment. Horses. Riding.	4th Section. War Establishment. Horses. Draught.	Grand Total. All Ranks.	Grand Total. Horses. Riding, public.	Grand Total. Horses. Draught.
OFFICERS.*															
Deputy Commissary	1	1	..	..	...	..	..	..	..	..	..	..	1	1	..
Assistant Commissary	1	1	..		1	..	1	1	..	1	1	..	2 / 2	2 / 2	..
Total Officers	2	2	..	1	1	..	1	1	..	1	1	..	5	5	..
NON-COMMISSIONED OFFICERS AND MEN.															
Serjt.-Major (2nd Class Staff Serjt.)	1	1	..	..	..	..	..	..	..	..	..	..	1	1	..
Qr.-Mr. Serjt. (3rd Class Staff Serjt.)	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Serjeants (Discipline.)	1	1	..	†2	2	...	†2	1 / 1	..	†2	2	..	7	6 / 1	..
Corporals (Discipline.)	2	..	..	1 / 1	..	..	2	..	..	2	..	..	7 / 1	..	..
2nd Corporals (Discipline.)	1	..	..	1	..	..	1	..	..	1	..	..	4	..	..
Serjt. Wheeler (3rd Class Staff Serjt.) (Artificers.)	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Serjt. Farrier, &c. (3rd Class Staff Serjt.) (Artificers.)	1	1	..	..	..	..	..	..	..	..	..	..	1	1	..
Serjt. Saddler (3rd Class Staff Serjt.) (Artificers.)	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Corporal Wheeler (Artificers.)	..	..	..	1	..	..	1	..	..	1	..	..	1 / 2	..	..
Corporal Farrier, &c. (Artificers.)	..	..	..	1	..	..	1	..	..	1	..	..	1 / 2	..	..
Corporal Saddler (Artificers.)	..	..	..	1	..	..	1	..	..	1	..	..	1 / 2	..	..
Rank and File Shoeing and Carriage Smiths (Artificers.)	1	..	..	1	..	..	1	..	..	1	..	..	3 / 1	..	..
Trumpeters	1	1	..	1	1	..	1	1	..	1	1	..	1 / 3	1 / 3	..
Drivers (Private)	‡39	..	‡19	‡30	..	‡20	‡20	..	‡20	‡20	..	‡20	100	..	79
Total N.C. Officers and Men	41	4	19	34 / 6	2 / 1	20	29 / 1	1 / 2	20	26 / 4	2 / 1	20	180 / 11	9 79 / 4 ..	
Total existing Establishment	43	6	19	34	2	20	30	2	20	26	2	20	133	12 79	
To be added	..	..	..	7	2	..	1	2	..	5	2	..	13	6 ..	
Grand Total	43	6	19	41	4	20	31	4	20	31	4	20	146	18 79 / 97	

Note.—(*a*) The Drivers and Draught Horses will be augmented to whatever number may be necessary from Reserves or local means.

(*b*) The repairs to Harness, and Shoeing of Horses, of Regimental Transport, will be performed by the Regimental Artificer.

(*c*) The repairs of Carriages of all Transport, and Shoeing of Staff Officers' Horses, will be performed by the Artificers of the Transport Detachment attached to the Brigade, &c.

(*d*) In case of the establishment of Regimental Artificers being unequal to perform the necessary repairs to Saddlery, &c., the work will be performed as in (*c*).

* By the Commissariat and Transport Tables of an Army-Corps, each Brigade and Division has a further establishment of Officers who would be available for transport purposes on an emergency.

† Promote 1 Serjeant as Serjeant-Major, except No. 2 Section when with Bearer Company.

‡ Draught Horses and Drivers to be added as required.

Each Officer is allowed 1 Public Service Horse and 1 Batman, who will be taken from the Reserve. He will be ur

DEPARTMENTAL TRANSPORT

DUTIES FOR WHICH THE SECTIONS ARE DETAILED.	DETAIL OF TRANSPORT COMPANIES.

)RT DEPARTMENT.

ARMY-CORPS IN THE FIELD.

	Horses.		Carriages.												
	Riding, Public.	Draught.	ice Wagon	t Wag ns for &c. (2-horse).	(4-horsed).	2-horsed).	-horsed).	Ovens.	arrying Ovens, -horsed).	(4-horsed).	Wagon, for 2-horsed).	n (2-horsed).	gon	ry Wagons n).	

Recapitulation of Transport Companies.

	Company.	Section.	Duty.	Officers.	N. C. O. & Men, including Batmen.	Drivers.	Total.	Riding. Public.	Draught.	Spare.	Total.	Carriages
1st Line.	I.	1st	Divisional details of I. Division	2	13	46	61	6	82	10	98	2
		2nd	Bearer Company	1	9	43	53	4	80	6	90	4
		3rd	1st Brigade	1	11	22	34	4	40	4	48	1
		4th	2nd Brigade	1	11	22	34	4	40	4	48	1
			Total No. I. Company	5	44	133	182	18	242	24	284	8
	II.	1st	Divisional details of II. Division	2	13	46	61	6	82	10	98	2
		2nd	Bearer Company	1	9	43	53	4	80	6	90	4
		3rd	1st Brigade	1	11	22	34	4	40	4	48	1
		4th	2nd Brigade	1	11	22	34	4	40	4	48	1
			Total No. II. Company	5	44	133	182	18	242	24	284	8
	III.	1st	Divisional details of III. Division	2	13	46	61	6	82	10	98	2
		2nd	Bearer Company	1	9	43	53	4	80	6	90	4
		3rd	1st Brigade	1	11	22	34	4	40	4	48	1
		4th	2nd Brigade	1	11	22	34	4	40	4	48	1
			Total No. III. Company	5	44	133	182	18	242	24	284	8
	IV.	1st	Head-Quarters of Army Corps	2	13	36	51	6	64	8	78	1
		*2nd		1	11	30	42	4	20	..	24	
		3rd		1	11	47	59	4	84	10	98	2
		4th	Cavalry Brigade	1	11	62	74	4	110	14	128	3
			Total No. IV. Company	5	46	175	226	18	278	32	328	8
2nd Line.	V.	1st	2 Field Hospitals	2	13	46	61	6	88	4	98	2
		2nd	2nd day's Provisions and Commissariat Det. — I. Division	1	11	67	79	4	128	6	138	3
		3rd	2 Field Hospitals	1	11	46	58	4	88	4	96	2
		4th	2nd day's Provisions and Commissariat Det. — II. Division	1	11	67	79	4	128	6	138	3
			Total No. V. Company	5	46	226	277	18	432	20	470	11
	VI.	1st	2 Field Hospitals	2	13	46	61	6	88	4	98	2
		2nd	2nd day's Provisions and Commissariat Det. — III. Division	1	11	67	79	4	128	6	138	3
		3rd	2nd do do — Cavalry Bde.	1	11	31	43	4	60	2	66	1
		4th	2nd do do — Corps Details	1	11	46	58	4	88	4	96	2
			Total No. VI. Company	5	46	190	241	18	364	16	398	9
	VII.	1st	†3 Field Hospitals (of the six with Head-Quarters)	3	24	73	100	10	188	8	156	7
		2nd										
		3rd	Bakery Train (Hd-Qrs.)	1	11	43	55	4	82	4	90	2
		4th	Ordnance Store (Hd-Qrs.)	1	11	63	75	4	120	6	130	3
			Total No. VII. Company	5	46	179	230	18	340	18	376	12
	VIII.	1st	*Reserve Company to Army-Corps and available for carriage of about three-fourths of the tentage for the whole force at one time*	2	13	56	71	6	108	4	118	3
		2nd		1	11	56	68	4	108	4	116	3
		3rd		1	11	56	68	4	108	4	116	3
		4th		1	11	56	68	4	108	4	116	2
			Total No. VIII. Company	5	46	224	275	18	432	16	466	11
			Total 1st Line	20	178	574	772	72	1,004	104	1,180	33
			Total 2nd Line	20	184	819	1,023	72	1,568	70	1,710	44
			GRAND TOTAL	40	362	1,393	1,795	144	2,572	174	2,890	78

* *Cadre Section as Reserve to 1st Line.* † Carriages for 6, but Transport for 3 only estimated.

Note.—92 drivers of the 1st Line, and 48 drivers of the 2nd Line, may be "hired" in place of "military" drivers.

The Jât and Lobana castes of Sikhs possess in a high degree the useful knowledge of the lading and care of beasts of burden. In olden days the people of the Lobana caste were the carriers of the country.

The following Appendix is in place of the paragraphs commencing at p. 86 *with the words, "The tables showing," to "For a force of about* 9000 *strong."*

F (p. 86).

The tables showing the war strength and composition of one of our Divisions and Army Corps show what is deemed necessary for the conveyance of baggage, camp equipage, intrenching tools, Infantry and Artillery reserve ammunition, field hospitals, sick and wounded, bakery and butchery trains, and two days' provisions and forage—what, in fact, may be taken as the known quantity. No mention whatever is made of the transport required in excess of this for the commissariat supplies to be moved in rear of the army, a quantity which always varies according to circumstances.

The strength of an Army Corps is given at 36,993 of all ranks, with 12,849 horses and 1573 carriages. Taking the soldier's ration, exclusive of meat, at 2lbs. per diem, the weight of three days' provisions to follow an Army Corps would amount to 221,958lbs.; this, with three days' more to follow still further in rear, would give a total weight of 443,916lbs., requiring for its transport 201 carriages and 804 horses.

Hay or straw for the horses will seldom be carried, as these bulky articles would greatly augment the transport of an army. These must be obtained in the country where the army is operating, either by requisition, or by parties going out to cut the standing crops. However, in some cases (notably in the Afghan war, where no forage was to be had, and number of horses died, or became unfit for work, owing to the great scarcity of food), we may have to move cavalry

and transport animals through a country entirely wanting in forage, and must make provisions for its carriage.

Taking the forage for each horse at 22lbs., we find 848,034lbs. required for three days; the same amount for three other days, to follow with the provisions still further in rear, will give a total of 1,696,068lbs., demanding 767 carriages, with 3068 horses. The total transport required for six days' provisions and forage to follow an Army Corps, will therefore amount to about 968 carriages, with 3872 horses.

The strength of a division—10,154 of all ranks, with 2450 horses and 320 carriages—approaches more to the strength of the expeditionary forces we have employed in such countries as China, New Zealand, and Abyssinia. The transport for six days' provisions and forage for this will amount to 147 carriages, with 588 horses. To these totals must be added a certain percentage of spare animals, which can be calculated to amount to from 10 to 20 per cent of the above numbers.

G (p. 97).

The French have used for many years light companies (*compagnies légères*) with mules for the carriage of the sick and wounded. These are attached to the ambulances, and have the advantage of being able to follow the combat everywhere, on ground impracticable for wheel-carriages, removing the wounded from the battle-field to the ambulance wagons kept further in rear.

H (p. 115).

The adoption of one pattern carriage alike for all services, which has been advocated by some writers abroad, is impossible, on account of the variety of uses carriages are put to. One of the arguments in favour of this measure is the supposed advantage of being able to utilize the empty carriages of every service for any purpose on a sudden contingency arising; but the transferring of transport carriages from one service to another would lead to serious results, as it would

cause confusion, and would tend to disorganize, for a longer or shorter period, that portion of the army which has been deprived of its carriage. At first sight, it appears that horses might with advantage be changed during the progress of a war, so that those which have for some time drawn heavy loads might be transferred to lighter ones, and thus suffer a lesser strain on their constitutions. In practice this has not been found to work well; and it is not advisable to shift them from one section to another. Empty carriages returning to the rear may and have been frequently used to remove sick and wounded. Some of these are without cover or protection from sun and rain; others are without springs, and therefore unsuitable for this purpose; but necessity knows no law, and necessity at times compels their use.

With carriages what is principally required is that they should be light, the dead weight being reduced to a minimum, and the horses should be led by drivers and not by riders. With regard to this last point, the system of having a rider for each pair of horses is nothing less than a waste of power in transport, where the horses are neither required to go at the pace Artillery are required to move at, nor to pass over every description of ground. The near horses have enough of work to do in carrying the rider, and are of little real assistance in drawing. This style of driving with postilions is never met with in the ordinary carriage of any country. Why should it be retained in the transport of an army, where more economy of power is needed?

I (p. 117).

A light carriage, not more than 12cwt. in weight, is what is principally required. This, with a driver and pair of horses, would answer admirably for service in most countries. The heavy four-horse wagon with riders might be replaced with advantage and economy by two-horse carriages of this description, from which would result the reduction of a pair of horses and one man per wagon. Let us take one of the

four-horse General Service wagons detailed for a double company of Infantry. In the "Regimental Transport Manual" we find the weight laid down for this at 28cwt. 3qrs. 0lbs., or 3220lbs. Deduct from this the weight of the G. S. wagon (given in the "Soldiers' Pocket-book" at 16¼ cwts. or 1820lbs.) and we obtain 1404lbs. as the weight of the articles carried. Sir G. Wolseley, in his "Pocket-book," gives the load carried by the two-horse wagons used in the Red River Expedition, over very bad roads, as varying from 1600 to 1900lbs., which is a heavier load than what is carried by the G. S. wagon. This shows that by the use of suitable light carts and drivers, the number of transport carriages need not be increased, whilst the number of horses and men can undergo a considerable diminution. The Maltese cart drawn by mules has been found very well suited for service with an army in the field. Two-wheeled carts are, however, generally speaking, unsuited for very hilly roads.

K (p. 119).

Harness for the regular transport should be good English harness, Artillery pattern; all of one pattern, and interchangeable. Transport horses will thus be able to be used Artillery purposes, should a necessity for doing so arise.

L (p. 134).

Under the appellation of auxiliary transport are included all the transport services called to the aid of the regular or permanent train, which train never possesses all the resources necessary to perform the entire transport of an army.

M (p. 134).

The experience gained by our allies in the Crimea shows that, of all the auxiliary transports, those formed either entirely of civil elements, or of animals and *matériel* the property of the state, driven by civil conductors, are not to be depended on, and are a waste of public money. The only

system that stood a severe test was the formation of well-organized provisional companies, with animals and *matériel* the property of the state, and an exclusively military *personnel*.

N (p. 181).

Any elaborate returns required for future reference should be prepared by writers and clerks at the base.

O (p. 181).

The transport attached in the field to the various branches of the service, or detailed for special duties, according to the organization tables issued with Army Circulars of 1st December, 1877, is as follows:—

OFFICERS AND MEN, HORSES AND CARRIAGES REQUIRED FOR A DIVISION WITHOUT TENTS.

	Officers and Men.			Horses.					
	Officers.	Non-Commissioned Officers.	Drivers.	Riding.	Draught.	Spare.	Pack.	Total.	Carriages.
2 Brigades of Infantry with $\frac{3}{I}$ and $\frac{4}{I}$ Secs. of Trans. Co.	8	28	176	20	320	32	...	372	94
One Infantry Battalion	1	1	22	2	40	4	...	46	12
One Cavalry Regiment.....	...	1	22	1	40	4	...	45	10
Infantry and Artillery Ammunition Reserve	6	85	123	19	214	22	...	255	51
Transport Company R. Engs.	...	...	26	...	24	4	3	31	6
$\frac{1}{I}$ and $\frac{2}{I}$ Sections Trans. Co.	3	22	89	10	162	16	...	188	61
$\frac{1}{V}$ and $\frac{2}{V}$ Sections „ „	3	24	113	10	216	10	...	236	56
Total for Div. without Tents.	21	161	571	62	1016	92	3	1173	290*

* The 80 carriages of Field Batteries moving with the combatants not included.

TRANSPORT REQUIRED FOR A DIVISION WITHOUT TENTS AND FOR ITS VARIOUS COMPONENT PARTS.

	Officers and Men.			Horses.					Carriages.																	
	Officers.	Non-Commissioned Officers and Men.	Drivers	Riding.	Draught.	Spare.	Pack.	Total.	General Service Wagons, 4-horsed.	Forge Waggons, 2 and 4 Horsed.	S. A. A. Carts, 2 and 4 horsed.	Carts or Light Wagons for Equipment, Stores, Tools, etc., 2-horsed.	Water Carts, 2-horsed.	Ambulance Wagons, 2-horsed.	Surgery Wagons, 2-horsed.	Pharmacy Wagons, 4-horsed.	Supply Carts, 2-horsed.	Waggons' Equipment, 2-horsed.	G. S. Wagon for Hospital Purposes, 4-horsed.	16 Pr., 4-horsed.	9 Pr., 4-horsed.	For Ammunition: 6 and 4 horsed.	For Rockets, 4-horsed.	For Stores and Baggage, 4 and 6 horsed.	Ammunition Wagons R. M. L. 6 and 8 horsed.	Total Carriages.
An Infantry Battalion without Tents	1	1	22	2	40	4	..	46	8	..	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	12
Section Transport Company for Infantry Brigade with Tents	1	1	28	2	52	4	..	58	11	..	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	15
Infantry Brigade without Tents and Section Transport Company	1	1	22	4	40	4	..	48	8	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	11
" " with Tents and " " "	4	14	88	10	160	16	..	186	32	1	9	5	..	..	..	..	..	..	..	..	..	..	..	..	..	47
Cavalry Regiments without Tents	4	14	106	10	196	16	..	222	41	1	9	5	..	..	..	..	..	..	..	..	..	..	..	..	..	56
" " with Tents	..	1	22	1	40	4	..	45	8	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10
Section Transport Company for two Field Hospitals	..	1	30	1	52	4	..	57	12	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14
" " " for Divisional Details	2	13	46	6	88	4	..	98	8	..	..	..	4	..	..	4	..	..	8	..	..	..	..	..	..	24
" " " for Second Day's Provisions and Commissariat Detachment	2	13	46	6	82	10	..	98	19	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	21
Bearer Company Transport 1st Line	1	11	67	4	128	6	..	138	31	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32
" " " 1st and 2nd Line	1	9	20	4	34	6	..	44	..	..	..	..	2	10	2	..	1	2	..	..	..	..	..	..	..	17
" " " 1st and 2nd Line with Tents	1	9	43	4	80	6	..	90	..	..	..	..	2	33	2	..	1	2	..	..	..	..	..	..	..	40
Infantry and Artillery Divisional Ammunition Reserve	1	9	47	4	88	6	..	98	2	..	..	..	2	33	2	..	1	2	..	..	..	..	..	..	..	42
Company Royal Engineers, Transport for	6	85	123	19	214	22	..	255	..	1	22	..	..	..	..	..	..	..	..	1	1	10	1	3	12	51
A Division without Tents	..	..	26	..	24	4	3	31	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
	21	161	571	62	1016	92	3	1173	144	6	44	12	6	3*	2	4	1‡	2‡	8	1	1	10	1	3	12	290†

* Includes 23 carriages which, when procurable, are to be obtained from local sources.
† Included in total of fourth column in organization tables.
‡ The thirty carriages of the Field Batteries are not included in this table as they move with the combatants.

OFFICERS AND MEN, HORSES AND CARRIAGES REQUIRED FOR AN ARMY CORPS WITHOUT TENTS.

	Officers and Men.			Horses.					
	Officers.	Non-commissioned Officers and Men.	Drivers.	Riding.	Draught.	Spare.	Pack.	Total.	Carriages.
3 Divisions without Tents ...	63	483	1713	186	3048	276	9	3519	870
Cavalry Brigade with $\frac{4}{IV}$ Section Transport Company ...	1	14	128	7	230	26	...	263	68
Army Corps Ammunition Reserve	18	255	240	57	384	66	...	507	99
Company Royal Engineers and Field Park	1	9	50	7	60	10	3	80	15
Pontoon Troop R. Engineers	9	182	148	33	184	22	...	239	31
½ Telegraph Troop ditto	7	106	66	31	68	6	...	105	13
$\frac{1}{IV}$ $\frac{2}{IV}$ $\frac{3}{IV}$ Section Transport Company.....	4	35	113	14	168	18	...	200	51
$\frac{3}{VI}$ $\frac{4}{VI}$ ditto ditto	2	22	77	8	148	6	...	162	37
VII. Transport Company.....	5	46	179	18	340	18	...	376	127
VIII. ditto (Reserve)	5	46	224	18	432	16	...	466	112
Transport for an Army Corps without Tents.....	115	1198	2938	379	5062	464	12	5917	1423
Artillery Carriages (not included).....	...	...	...	...	...	...	...	...	150
Total Carriages	...	...	...	...	...	...	...	...	1573

TRANSPORT REQUIRED FOR AN ARMY CORPS WITHOUT TENTS AND ITS VARIOUS COMPONENT PARTS.

	Officers and Men.			Horses.					Carriages.																				To be requisitioned.		
	Officers.	Non-commissioned Officers and Men.	Drivers.	Riding.	Draught.	Spare.	Pack.	Total.	G. S. Wagon, 6 and 4 horsed (all patterns.)	Carts or light wagons for equipment, stores, tools, etc., 2-horsed.	Forge Wagons, 6 and 4 horsed (all patterns.)	S. A. A. Carts, 4 and 6 horsed.	Ammunition Wagon R. M. L. 8 and 6-horsed.	Spare gun car. with limber.		Ammunition and Store Wagons.			Office Wagons, 4-horsed.		Pontoon Wagons, 6-horsed.		Air Line Wagons, 6-horsed.	Wire Wagons, 6-horsed.	G. S. Wagons for Oven's (Aldershot) 4-horsed.	Bakery Vans, 4-horsed.	Water Carts, 2-horsed.	Ambulance Wagons, 6-horsed.	Surgery Wagons, 2-horsed.	Pharmacy Wagons, 4-horsed.	Carriages for Ambulance purposes, 2-horsed.	Wagons for G. S., 4-horsed.	Butchery Wagons, 4-horsed.
														16 pounder, 6-horsed.	6-pounder, 6-horsed.	For Ammunition, 6 and 4 horsed.	For Rockets, 4-horsed.	For Stores and Baggage, 4-horsed.	Telegraph.	Photography or Lithography.	Printing.	For Pontoons.	For Trestles.										
A Division without Tents.....	21	161	571	62	1016	92	3	1173	144	15	6	44	12	1	1	10	1	3	..	..	..	..	..	..	..	..	6	10	2	4	23	8	..
Section Transport Company for Cavalry Brigade	1	11	63	4	110	14	..	128	16	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	1	..	11	..	..
4/IV Sect. Trans. Com. and Cav. Brigade without Tents	1	14	118	7	230	26	..	263	40	3	*4	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	1	..	11	..	..
" with Tents.....	1	14	156	7	286	23	..	319	54	3	5	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	1	..	11	..	..
RI. Engineer Company and Field Park without Tents	1	9	50	7	60	10	3	80	13	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..
R. E. Pontoon Troop do.	9	182	148	33	184	23	..	239	6	..	1	..	..	..	..	..	..	..	..	..	..	20	4	..	..	..	..	..	..	..	..	..	..	..
Royal Engineer ½ Tel. Troop do.	7	106	66	31	68	6	..	105	2	..	1	..	..	..	..	..	..	2	..	..	..	..	..	2	6	..	..	..	..	..	..	..	..	..
1/IV Section Transport Company for Corps Details	2	13	36	6	64	8	..	78	4	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	1	..	12	..	..
3/IV Ditto, 1st Day's Provisions for Corps Details ..	1	11	47	4	84	10	..	98	21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2/IV Ditto, Reserve to 1st line ..	1	11	30	4	20	..	..	24	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3/IV Ditto, 2nd Day's Provisions Cavalry Brigade	1	11	31	4	60	2	..	66	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4/VI Ditto 2nd Day's Provisions for Corps Details....	1	11	46	4	88	4	..	96	21	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1&2/VII Two Secs. Trans. Com. for three Field Hospitals	3	24	73	10	138	8	..	156	24	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12	..	..	12	..	24	..
3/VII Ditto, for Bakery Train	1	11	43	4	82	4	..	90	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	17	..	5	..	..	..	..	..	..
4/VII Ditto, for Ordnance Stores	1	11	63	4	120	6	..	130	27	..	3																						
A. C. Ammunition Reserve	18	255	240	57	384	66	..	507	..	..	3	6	..	3	3	78	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

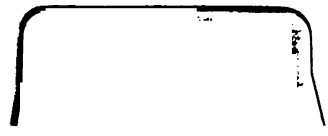
It would be a serious error to assume that the number of transport carriages given in these tables is all that will be required for an Army Corps on service. A large train of from 500 to 600 hired carriages must be obtained in excess, to bring the provisions from the nearest magazines on the line of communication up to the nearest transport wagons, otherwise these would fall so far to the rear in search of provisions as to render them of no use to the troops.

All the transport details shown in these tables are calculated to meet the requirements of an expeditionary force sent on active service in Europe.

CORRIGENDA.

P. 96, line 10, *for* "1875" *read* 1877.

P. 123, line 7, *omit* "peculiarity."

P. 134, line 3, *for* "A Transport Corps," *read*, A *sufficient* Transport Corps.

P. 180, line 16, *for* "A system," *read*, A *simple* system.